SERVICE MANUAL **®**@@

US Model AEP Model

#### **SPECIFICATIONS**

Tape & Reel size 6.25 mm  $\binom{1}{4}$  5" Reel 19 cm/s (7½ ips), Tape speed

9.5 cm/s (33/4 ips)

Audio track width 2.1 m/m for each track REC LEVEL 185 nwb/m at 0 dB

Time code track width

0.38 18 mm

Time accuracy of audio & time code track

Less than 8 msec (at tape speed 19 cm/s)

LINE IN/MIC input (selectable) XLR type

Min input level

LINE: -10 dBs (-20 dBs-+20

dBs set by internal

wiring)

MIC: -70 dBs. -50 dBs (at 20 dB ATT)

0 dBs = 0.775 V

Impedance LINE: 47 kilohm balanced

MIC: 10 kilohm balanced

DC POWER for MIC

DC 48 V (7 mA/CH) or 12 V (10 mA/CH) A-B with

OFF switch XLR type

Input level

0.5 - 5 Vp-p

Impedance

10 kilohm, balanced XLR type

Line output

Time code input

Output level

Impedance

0 dBs at 47 kilohm 600 ohm unbalanced

EXT. NR Input & output

TUCHEL 7-p type

Output level

0 dBs

Impedance

100 ohm unbalanced

Input level 0 dBs

Impedance

47 kilohm unbalanced

Monitor output (12V, 1kHz)

Install speaker (16 ohm)

500 mW

Headphones 1 mW (at 32 ohm)

Frequency response (AMPEX 456)

30-15000Hz ±2dB 19 cm/s

25-18000Hz ±3dB

9.5 cm/s 30-10000Hz ±2dB

Signal to Noise ratio (at 510nwb/m AMPEX 456)

19 cm/s More than 58 dB

61 dB ("A" WEIGHTED) 9.5 cm/s 57 dB

60 dB ("A" WEIGHTED)

Total harmonic distortion (1kHz, 510nwb/m, AMPEX 456)

19 cm/s Less than 2%

9.5 cm/s Less than 2.5%

Rec limiter characteristic

Suppressed 8 dB at +20 dB input

Warm-up time of power

Less than 1 sec

Erase efficiency (at 1kHz)

More than 70 dB

- Continued on pige 2 -

#### SAFETY-RELATED COMPONENT WARNING!

COMPONENTS IDENTIFIED BY SHADING AND MAIRK NON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY AFTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.





### **APR-2003**

Crosstalk (at 1kHz)

More than 45 dB Between audio track Audio track & time code track 80 dB

160 kHz Bias frequency

±0.08% DIN, 0.05% WRMS NAB Wow & Flutter 19 cm/s

9.5 cm/s ±0.12% DIN, 0.08% WRMS NAB

Speed stability

19 cm/s & 9.5 cm/s ±0.3%

FF/RWD TIME Approx. 60sec (185 m tape)

TAPE COUNTER 3 digits mechanical

Power

Power supply voltage and current necessary

DC 10-14 V, 2 A

Rechargeable battery (optional)

NP-1 (Battery life: More than

2H)

Ac adaptor (optional)

AC-500, AC-500CE Approx. 700 mA (NP-1)

**REC FWD Current** 

Approx. 750 mA (EXT. DC)

FF/FWD Current

Approx. 700 mA (NP-1)

Approx. 750 mA (EXT. DC)

Dimension

 $335(w) \times 140(h) \times 300(d)$  mm

 $(13\frac{1}{4} \times 5\frac{5}{8} \times 11\frac{7}{8}")$ 

Weight

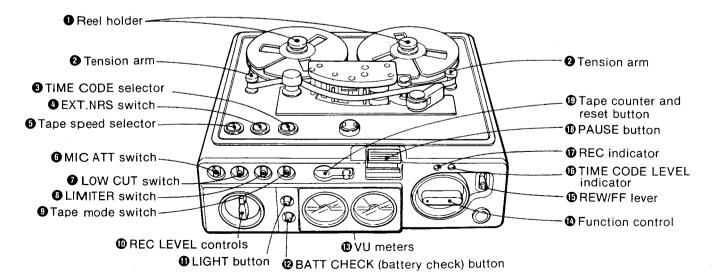
Approx. 6.7 kg (with NP-1)

## **SECTION 1 OUTLINE**

### **FUNCTION OF CONTROLS**

Each number in the text is keyed to the illustrations.

#### Front panel



#### Reel holders

#### **@** Tension arms

#### **13** TIME CODE selector

Normally, keep it at OFF.

For recording with the optional time code generator, set it to SMPTE/EBU. Time code recording can only be made when the tape speed selector is set to 19 cm/s  $(7\frac{1}{2} \text{ ips})$ .

#### **Ø** EXT. NRS switch

For recording with a noise reduction unit, set this switch to NRS (ON).

For recording without noise reduction system, set it to NORMAL (OFF). Recording cannot be made with this switch set to ON when a noise reduction unit is not connected to the EXT. NRS connector.

#### Tape speed selector

Select a tape speed appropriate to the type of recording desierd (19 cm/s,  $7^{1}/_{2}$  ips or 9.5 cm/s,  $3^{3}/_{4}$  ips).

#### 6 MIC ATT (microphone attenuator) switch

Set this switch to ON to attenuate the microphone input level by 20 dB.

#### LOW CUT switch

Set this switch to ON to attenuate frequencies lower than 100 Hz by 6 dB/oct.

#### LIMITER switch

Normally, leave it OFF.

Set it to ON to maintain the reference recording level and to eliminate undesirable distortion.

### Tape mode switch (TAPE/SOURCE)

Set it to TAPE for tape playback. While recording, set it to TAPE for tape monitoring, and set it to SOURCE for source monitoring.

#### **OREC LEVEL controls**

Varies the recording level. The outer knob controls CHANNEL 1 and the inner knob controls CHANNEL 2.

#### **⊕** LIGHT button

Illuminates the VU meters as long as the button is pressed.

#### **BATT CHECK (battery check) button**

Keep pressed to check the battery condition during recording or playback. When the needle of the right VU meter registers outside the green zone, the battery should be recharged.

#### ® VU meters

Indicates the recording level when the tape mode switch is set to SOURCE. When the tape mode switch is set to TAPE, the meters indicate the playback level. (0 VU = 185 nwb/m (NAB))

#### **®TIME CODE LEVEL indicator**

Lights up when a correct input signal is fed from the TIME CODE IN connector.

#### **®** REC indicator

#### @PAUSE button

Depress this button to pause momentarily during playback or recording. To release, press it again.

#### Tape counter and reset button

#### (2) Function control

Set to PLAY for playback and to STOP to stop the tape.

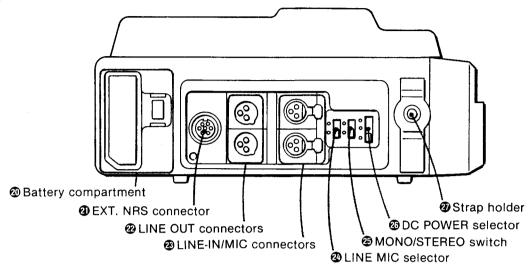
To record, push and turn towards REC.

To activate this control, the REW/FF lever **1** must be at stop position.

#### ® REW/FF lever

Set the lever to REW to rewind the tape. Pull the lever and push down to FF to advance the tape rapidly. To activate this lever, the function control **@** mustbe set at STOP.

#### Left side panel



#### @ Battery compartment

Insert an optional rechageable battery pack Sony NP-1.

#### **@EXT. NRS connector**

(Tuchel type, 7-P)
Connect a noise reduction unit here to record with the Dolby A NR system.

### **@LINE OUT connectors**

(XLR-3-32, unbalanced)
Produce the line output signals.

#### **❷LINE IN/MIC connectors**

(XLR-3-31, balanced)

Receive either line input or microphone signals according to the LINE/MIC selector setting.

#### **@LINE/MIC** selector

Selects the input source connected to the LINE IN/MIC connectors.

#### **MONO/STEREO switch** (for microphone)

Set it to STEREO for stereo recording with two microphones. Set it to MONO for monaural recording with one microphone, in which case, the microphone must be connected to the CHANNEL 1 connector.

#### **DC POWER selector** (for microphone)

Selects a setting to match the microphone's power requirements. LINE IN/MIC connectors can supply 12 V dc (10 mA/channel) or 48 V dc (7 mA/channel) to externally powered microphones. Set the DC POWER selector to the appropriate position when the tape recorder is in the stop mode, otherwise a click sound may be heard. Use the following settings.

**48 V:** For phantom powered condenser microphones.

**OFF:** For microphones requiring no external power.

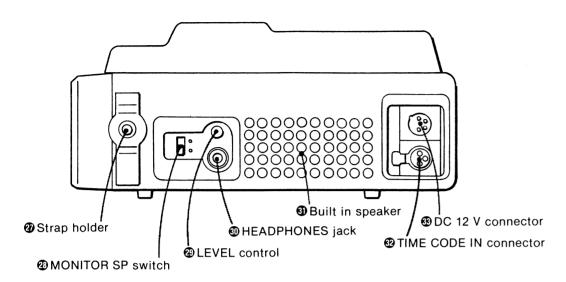
12 V A-B: For microphones with an AB feed powering system.

Set the DC POWER selector to 12 V A-B **only** for a microphone with an AB feed powering system. Otherwise, **the microphone may be damaged**.

#### Strap holder

## **APR-2003**

#### Right side panel



#### **MONITOR SP switch**

Set this switch to ON to monitor from the built-in speakers during recording and playback. You can alter the volume of the built-in speaker by adjusting the LEVEL control.

#### **⊕** LEVEL control

Varies the output level of the built-in speaker and the headphones. This control does not affect the VU meters or the output level of the LINE OUT connectors.

#### **® HEADPHONES jack**

Accepts any low impedance stereo headphones. The output level can be varied with the LEVEL control. When the headphones are connected, the built-in speaker is automatically disconnected.

#### Built-in speaker

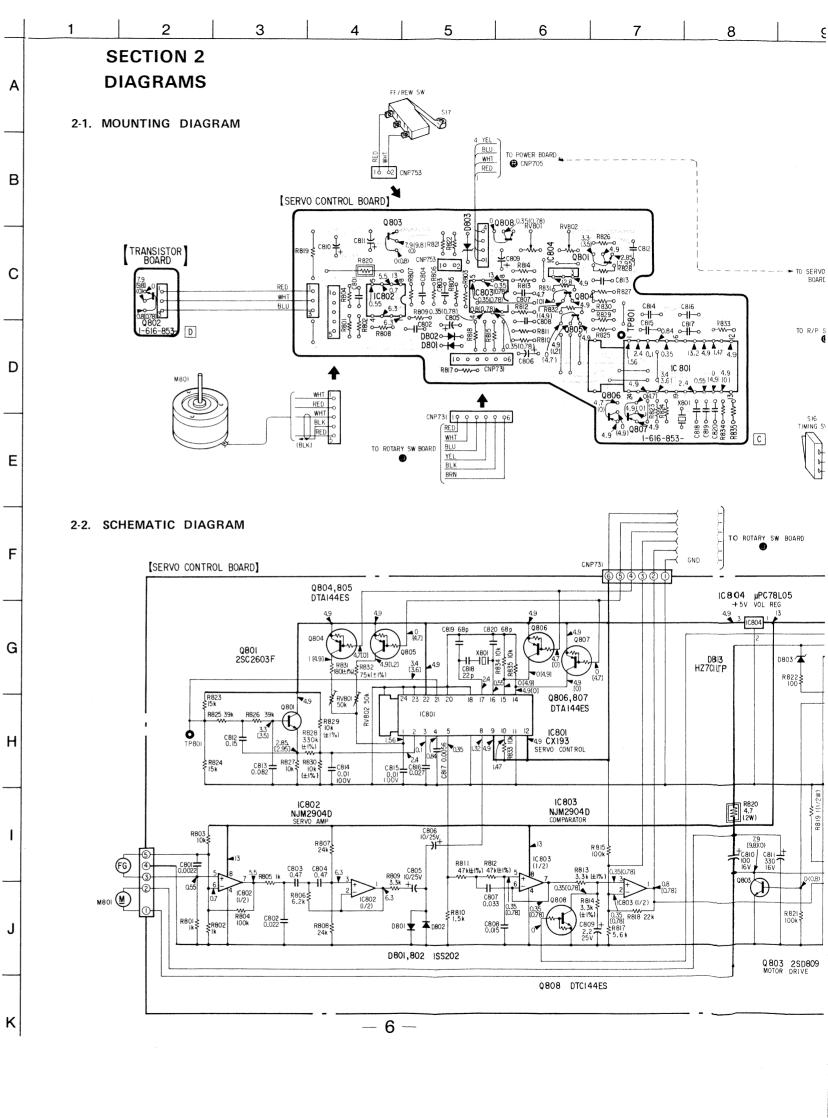
#### **® TIME CODE IN connector**

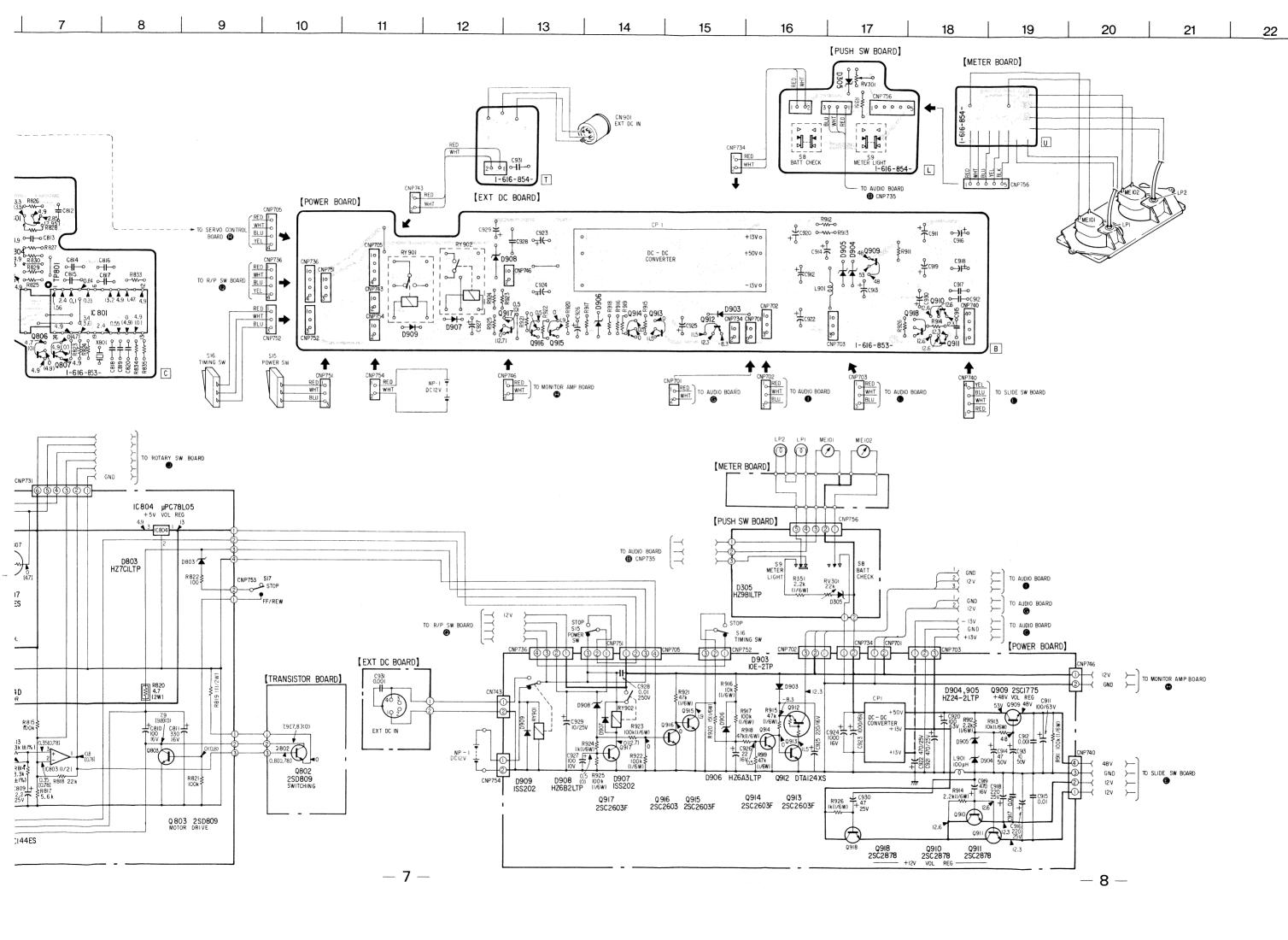
(XLR-3-31, balanced)
Accepts an optional time code generator such as the Sony BVG-100.

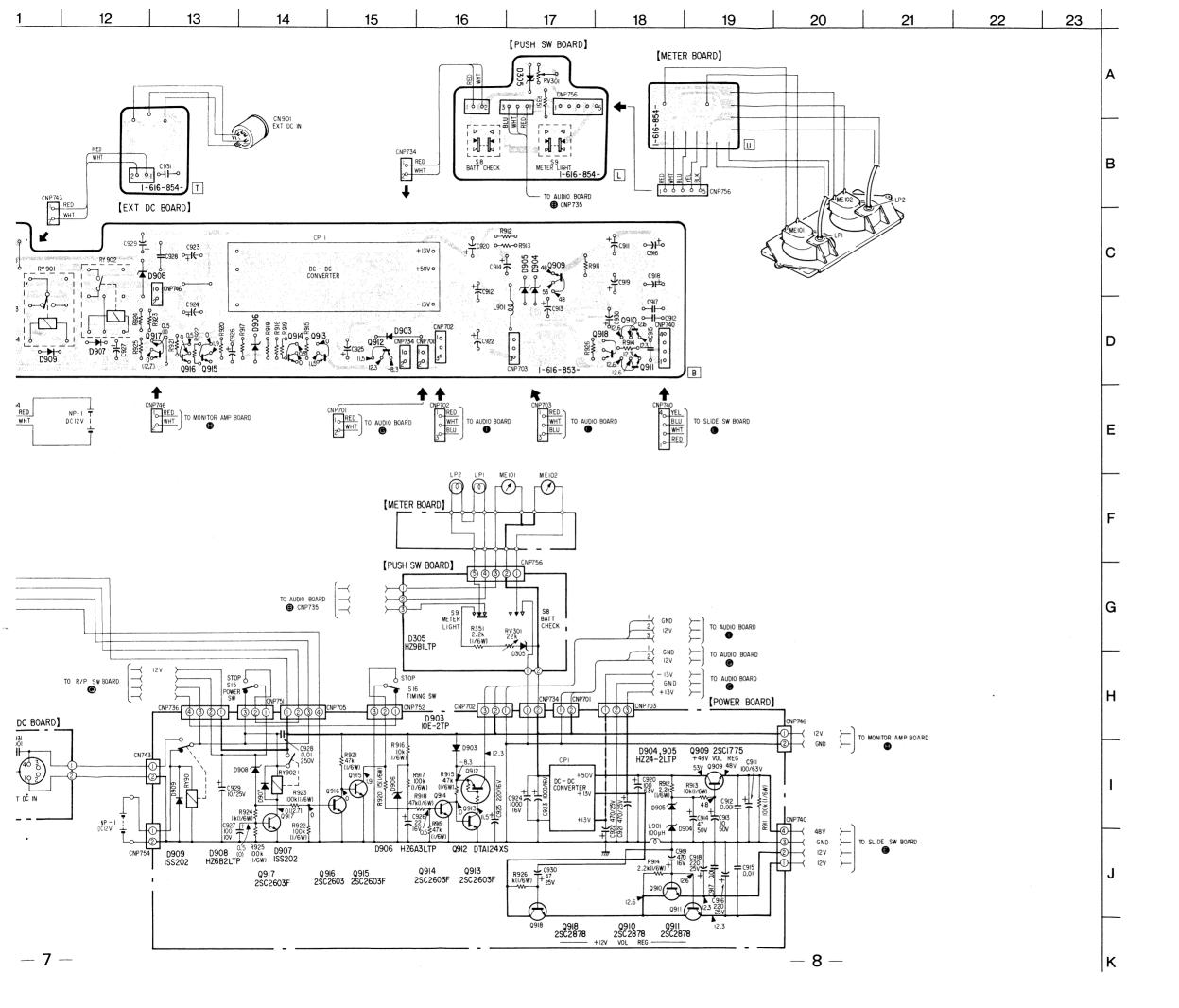
#### ® DC 12 V connector

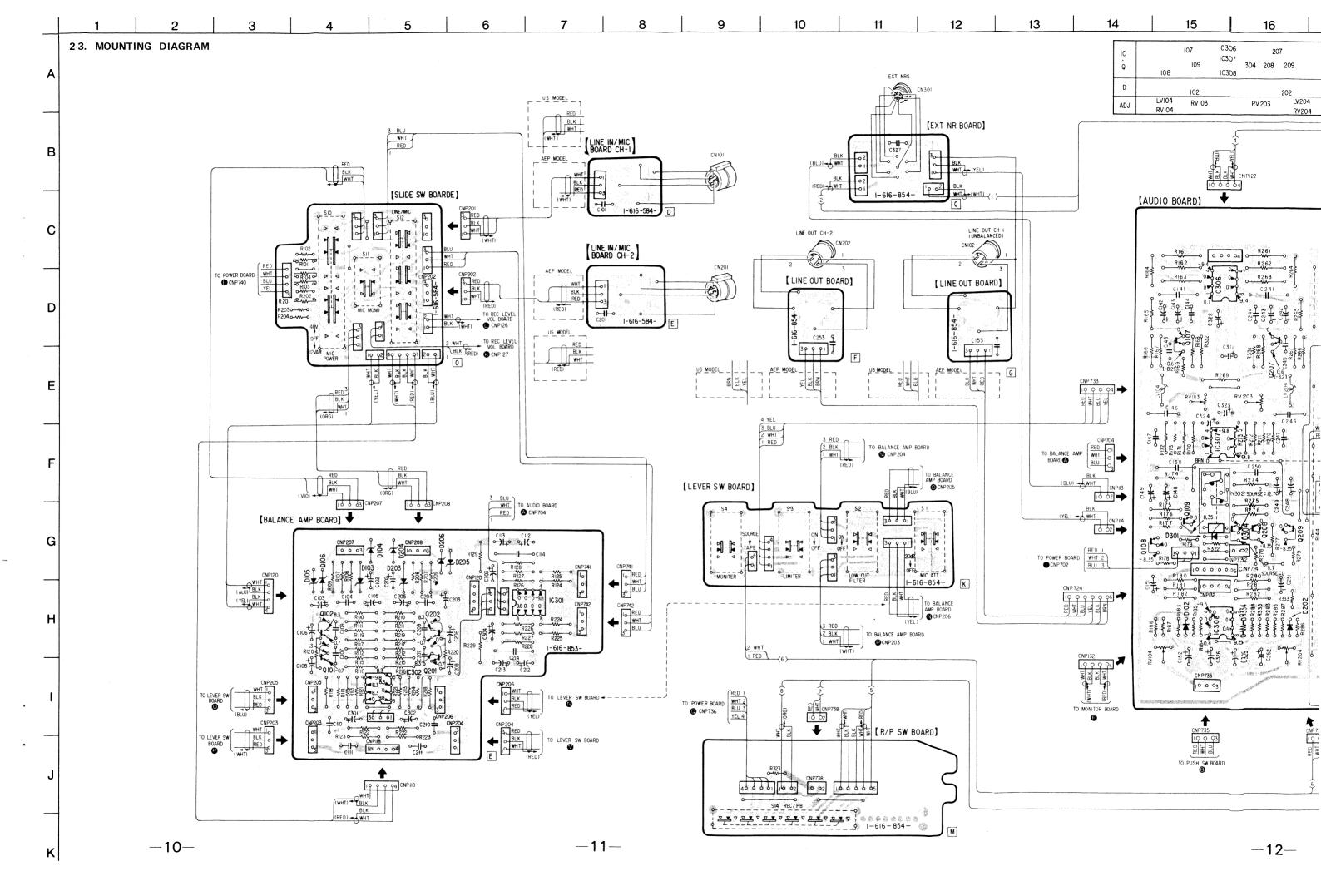
(XLR-4-32)

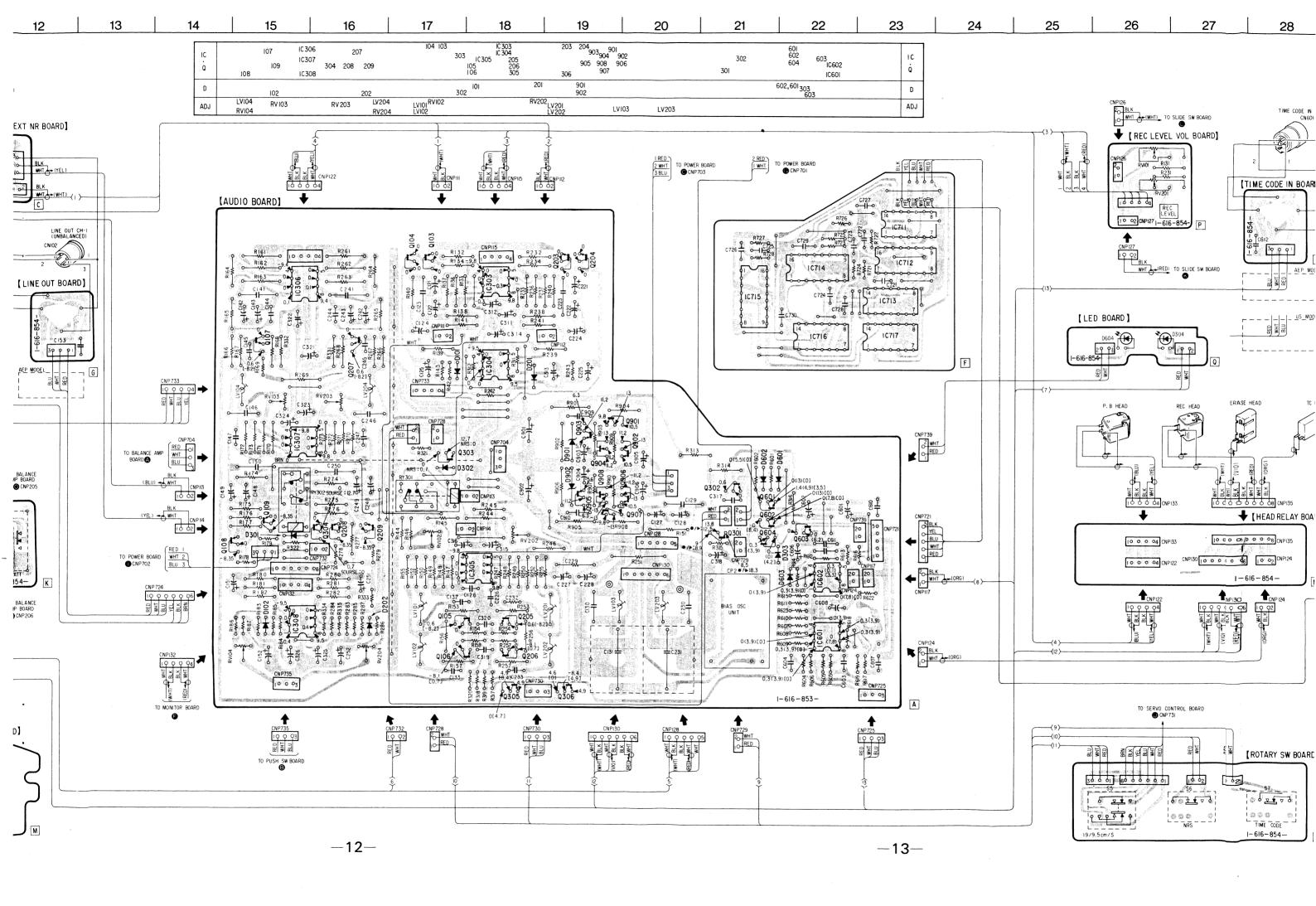
Must be used only with the Sony AC-500/AC-500CE optional ac power adaptor.

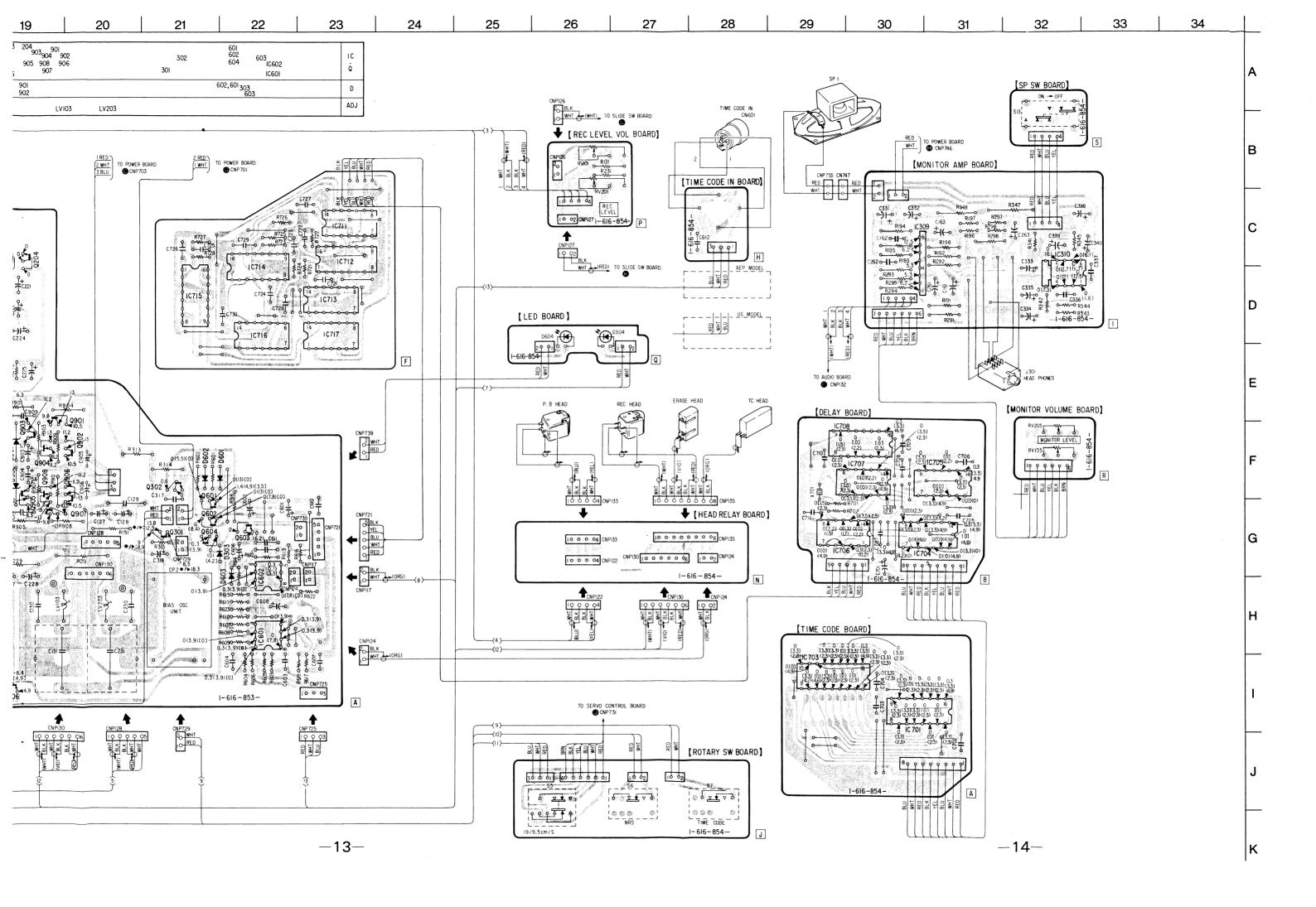


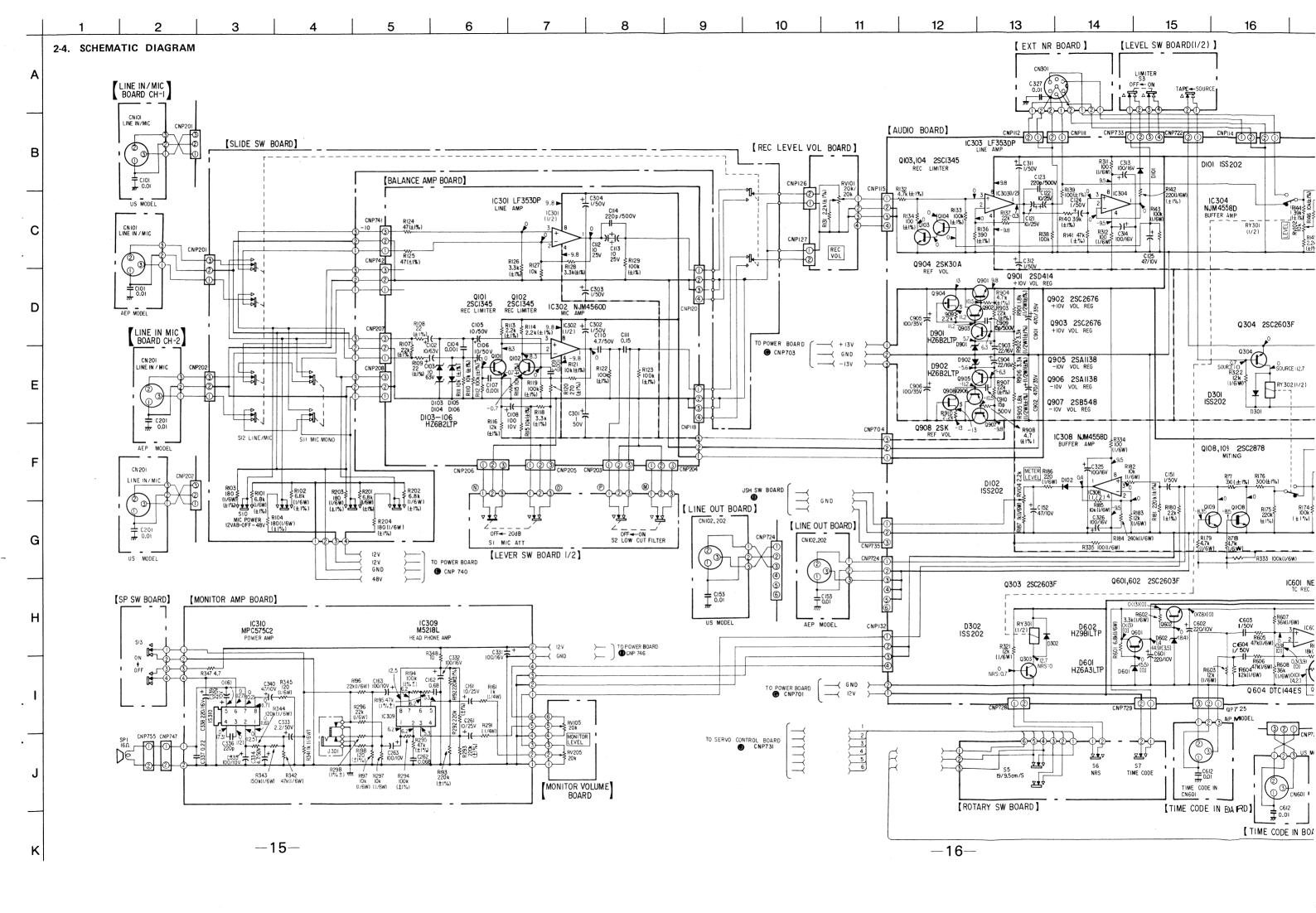


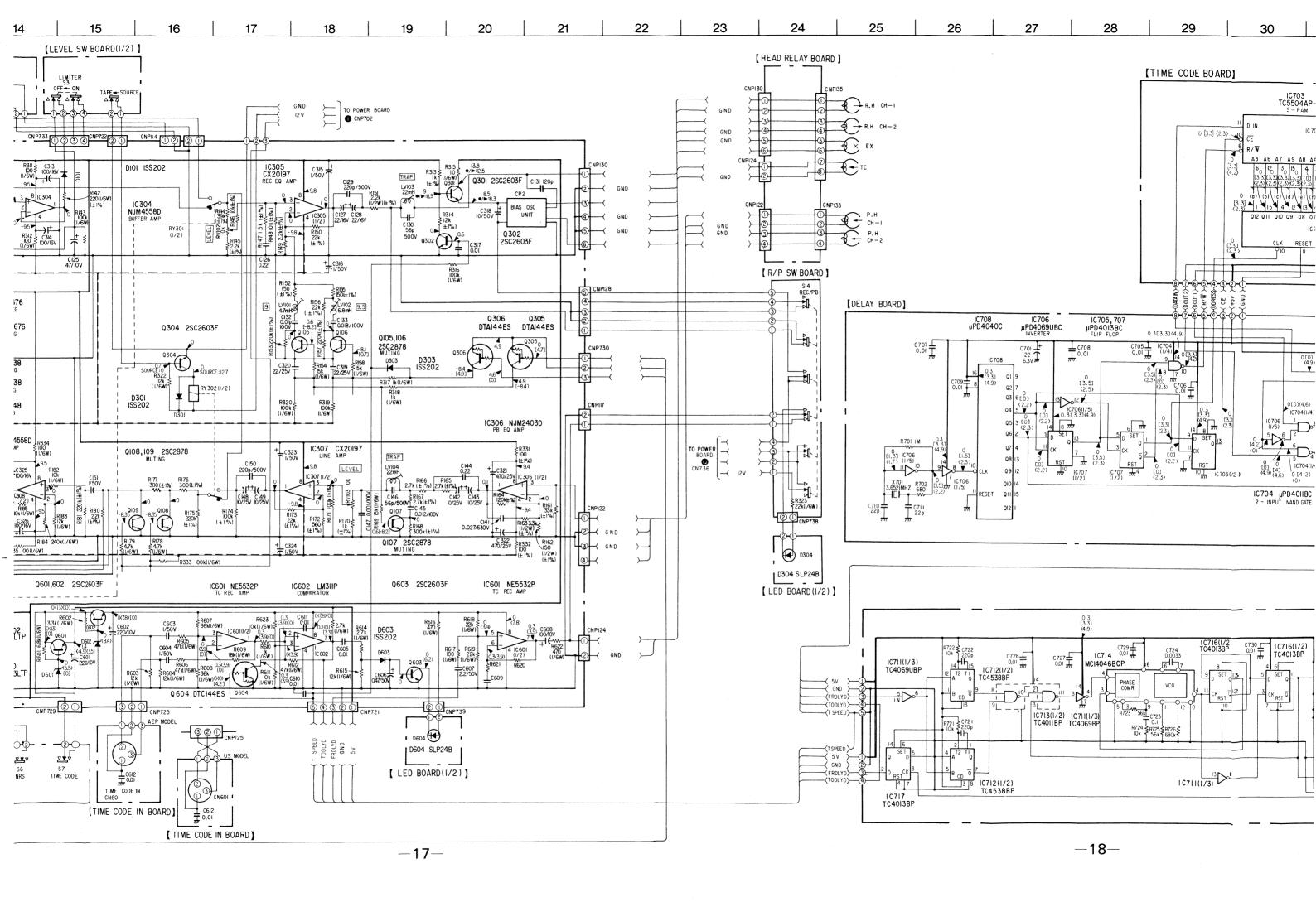


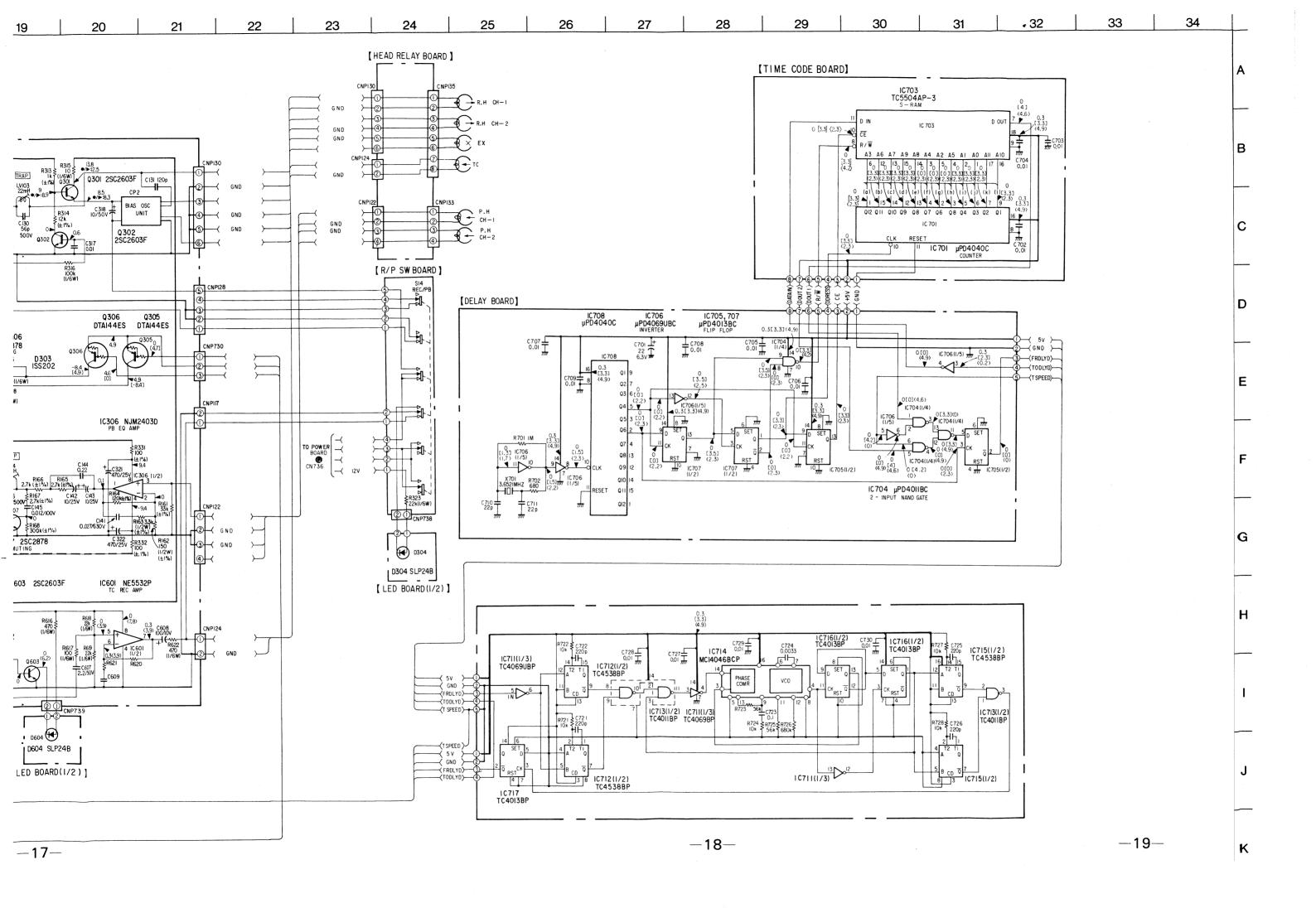












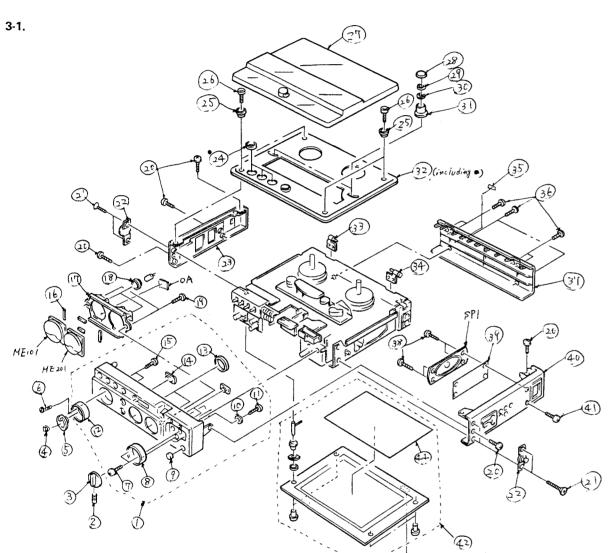
# SECTION 3 EXPLODED VIEWS AND PARTS LIST

#### MOTO

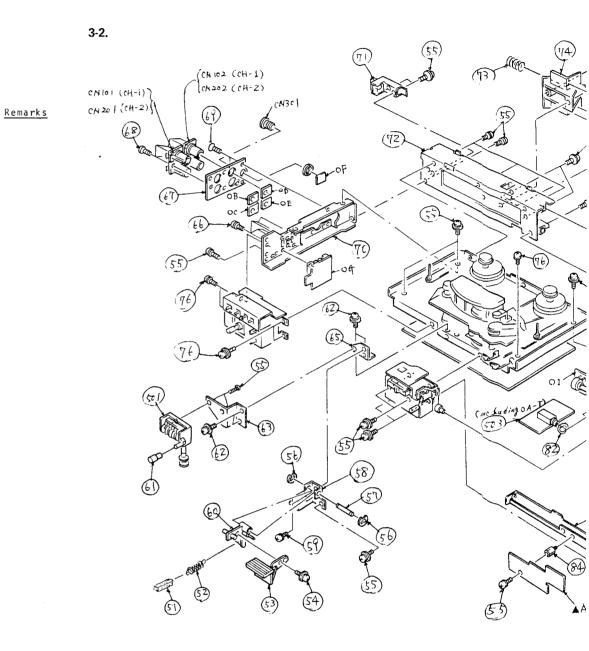
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " \* " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The construction parts of an assembled part are indicated with a collation number in the remark column.

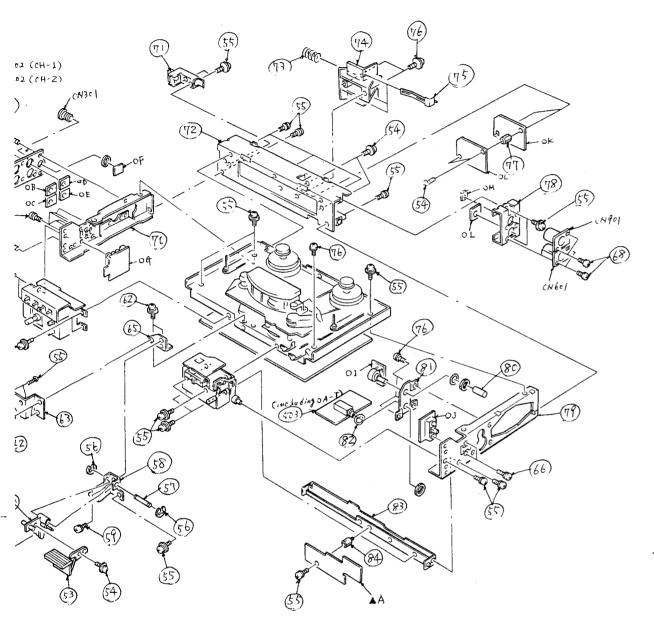
The components identified by shading and mark Aare critical for safety.

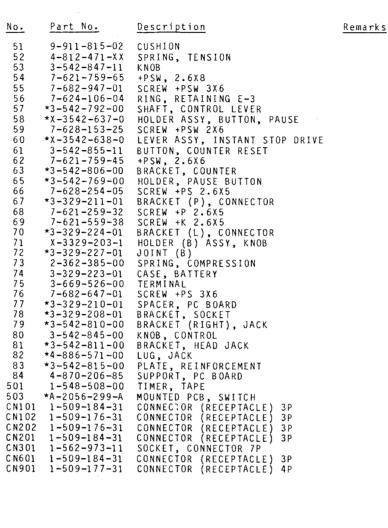
Replace only with part number specified.

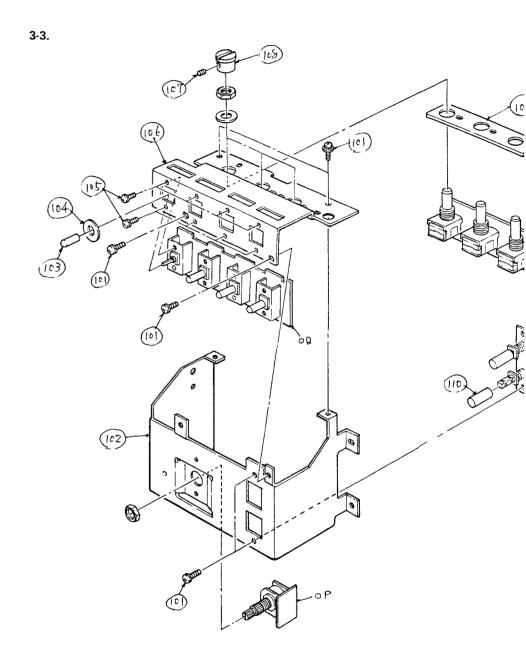


Description Part No. \*X-3542-652-5 COVER ASSY, FRONT COVER ASSY, FRONT
SC 4X6, HEXAGON SOCKET
CONVERTER ASSY
KNOB (R), RECORD LEVEL
KNOB (L), RECORD LEVEL
SCREW +B 3X6
SCREW +PSW 3X6
ESCUTCHEON, SELECTOR
EMBLEM ASSY
W 2 SMALL 7-683-247-31 X-3542-654-2 3-542-842-11 3-542-843-11 3-542-843-11 7-682-547-05 7-682-947-01 \*3-542-723-11 X-3542-653-4 7-688-001-01 7-621-255-45 \*3-542-722-11 \*3-542-721-11 W 2, SMALL
SCREW +P 2X6
ESCUTCHEON, CONTROL
ESCUTCHEON, METER 3-542-721-11 3-542-720-00 7-682-224-01 9-911-815-02 \*3-542-814-00 WINDOW, COUNTER SCREW +K 2X4 CUSHION BRACKET, METER
HOLDER, LAMP
SCREW +B 3X4
SCREW +B 3X4
SCREW +K 3X20
BRACKET ASSY, STRAP
PLATE (LEFT) (B) ASSY, SIDE
RING (B), ORNAMENTAL, KNOB
SPACER, PANEL
BOLT, HEXAGON SOCKET 2.6X6
PROTECTOR ASSY, DUST
ROLLER (A), TENSION
RING, RETAINING E-1.5
WASHER
ROLLER (B) ASSY, TENSION
PANEL ASSY (B), REEL
HINGE (E) ASSY
HINGE (E) ASSY
LABEL, MODEL NUMBER BRACKET, METER 3-442-022-02 7-682-547-01 7-682-546-05 7-682-253-05 X-3542-659-0 X-3329-205-1 3-329-212-01 3-542-830-11 7-621-996-04 X-3329-209-1 3-542-791-03 7-624-102-04 3-701-437-01 X-3542-616-5 X-3329-208-1 X-3542-668-0 X-3542-658-0 HINGE (B) ASSY
LABEL, MODEL NUMBER
BOLT, HEXAGON SOCKET 3X6
PLATE, CABINET BOTTOM
SCREW +P 3X5 TYPE2 NON-SLIT
NET, SPEAKER
PLATE (RIGHT) (B) ASSY, SIDE
SCREW +B 3X12 \*3-329-201-01 7-683-403-04 3-542-875-11 7-685-144-11 3-542-896-00 X-3329-206-1 7-682-550-05 SCREW +B 3X12
LID ASSY, REAR
LABEL, CAUTION, BOTTOM PLATE
PLATE, REAR LID SHIELD
LID, BATTERY
SHAFT, BATTERY LID
SPRING (A), TORSION
BRACKET (RIGHT), FRONT COVER
BRACKET (LEFT), FRONT COVER
SCREW +K 3X5 X-3329-204-1 \*3-329-901-01 3-542-899-03 2-362-388-21 2-362-324-00 3-329-206-01 \*3-542-724-00 \*3-542-725-00 7-682-246-01 SCREW +K 3X5 1-520-484-11 METER, LEVEL 1-520-484-21 METER, LEVEL 1-502-541-00 SPEAKER, CONE SCREW +K 3X5 METER, LEVEL METER, LEVEL









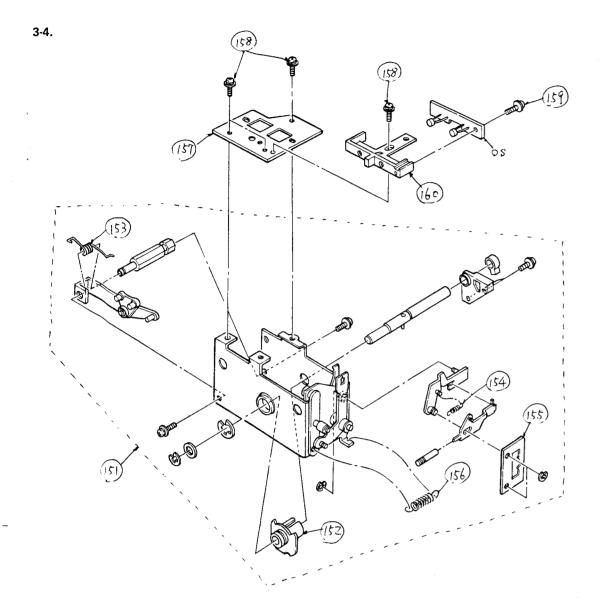
No.	Part No.	Description	Remarks	3-3.
No. 51 52 53 54 55 56 57 58 69 60	7-682-947-01 7-624-106-04 *3-542-792-00 *X-3542-637-0 7-628-153-25	SCREW +PSW 2X6 LEVER ASSY, INSTANT STOP DRIVE	<u>Remarks</u>	
62 63 65 66 67 68 69 70 71 72 73 74 75	7-621-759-45 *3-542-806-00 *3-542-769-00 7-628-254-05 *3-329-211-01 7-621-259-32 7-621-559-38 *3-329-224-01 X-3329-203-1 *3-329-227-01 2-362-385-00 3-329-223-01 3-669-526-00	+PSW, 2.6X6 BRACKET, COUNTER HOLDER, PAUSE BUTTON SCREW +PS 2.6X5 BRACKET (P), CONNECTOR SCREW +P 2.6X5 SCREW +K 2.6X5 BRACKET (L), CONNECTOR HOLDER (B) ASSY, KNOB JOINT (B) SPRING, COMPRESSION CASE, BATTERY		104 00 0 R
77 78 79 80 81 82 83 84 501 503 CN101 CN102 CN202 CN201 CN201	*3-329-210-01 *3-329-208-01 *3-542-810-00 3-542-811-00 *3-542-815-00 *3-542-815-00 4-870-206-85 1-548-508-00 *A-2056-299-A 1-509-184-31 1-509-176-31 1-509-184-31 1-509-184-31 1-509-184-31	SPACER, PC BOARD BRACKET, SOCKET BRACKET (RIGHT), JACK KNOB, CONTROL BRACKET, HEAD JACK LUG, JACK PLATE, REINFORCEMENT SUPPORT, PC BOARD TIMER, TAPE MOUNTED PCB, SWITCH CONNECTOR (RECEPTACLE) 3P SOCKET, CONNECTOR 7P		
C N 6 0 1	1-509-184-31	CONNECTOR (RECEPTACLE) 3P CONNECTOR (RECEPTACLE) 4P		

No. Part No. Description

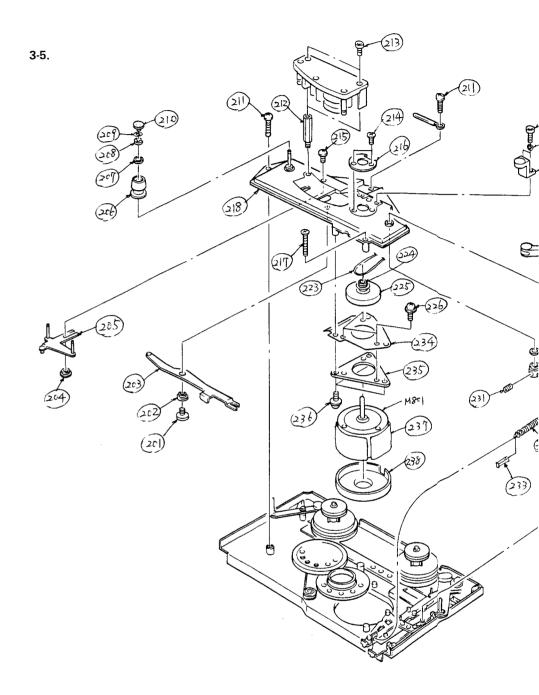
101 7-682-647-01 SCREW +PS 3X6
102 \*3-542-813-00 BRACKET (B), SWITCH
103 3-329-215-01 KNOB, LEVER SWITCH
104 3-533-938-00 CLOTH
105 7-628-254-05 SCREW +PS 2.6X5
106 \*3-542-812-00 BRACKET (A), SWITCH
107 7-683-237-31 SC 3X3, HEXAGON SOCKET
108 3-329-217-01 KNOB, MODE SELECTION
109 \*3-329-209-01 SPACER (A)
110 3-542-840-21 KNOB, RECORD MODE

Remarks

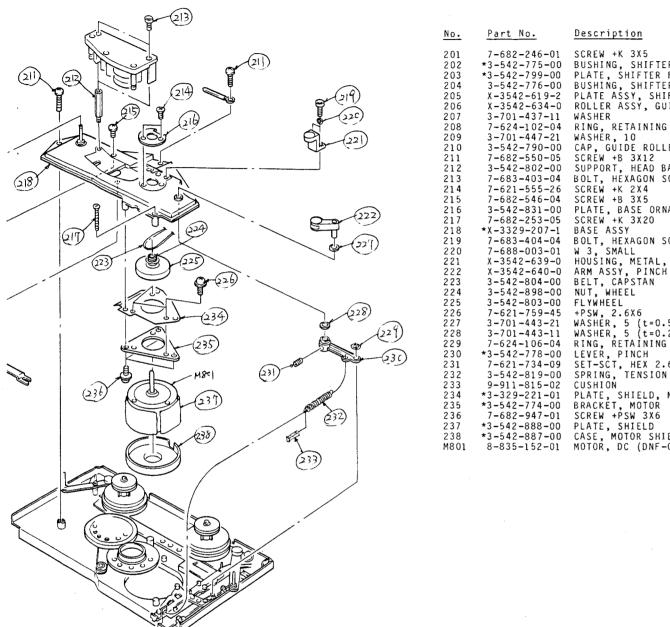
>



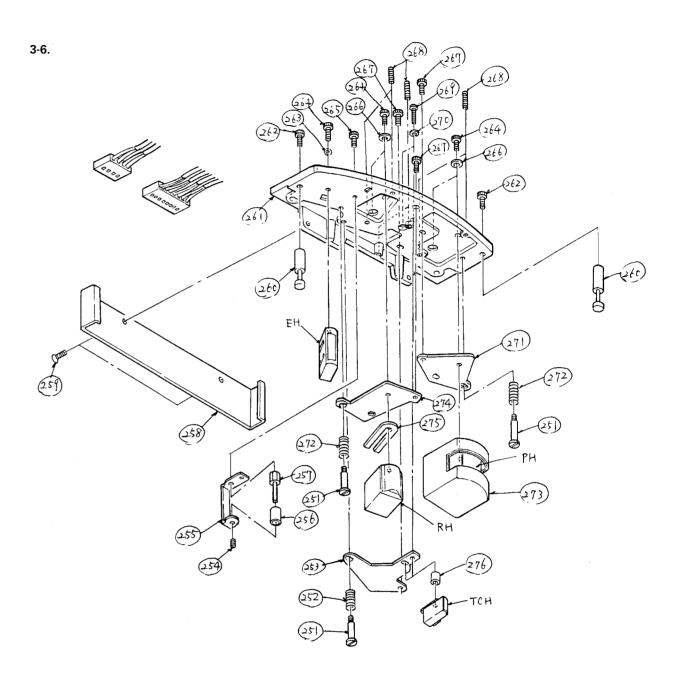
No.	Part No.	Description	Remarks
151	*X-3542-620-0	CONVERTER COMPLETE ASSY	
152	*3-542-644-00		
153	3-542-648-00	SPRING	
154	3-542-649-00	SPRING, TENSION	
155	*3-542-800-00		
156	3-542-865-00		
157	*3-542-777-00		
158	7-621-759-45		
159	7-685-533-21		
160	*3-542-851-00	BRACKET, REC LAMP	
161	*X-3542-622-0	PLATE ASSY, LOCK, FF & REW	
162	*X-3542-623-0	LEVER (A) ASSY, CONTROL	
163	*X-3542-624-0		
	*X-3542-625-0	LEVER A ASSY, FF & REW	
	*X-3542-626-0		
	X-3542-627-0		
	*3-542-643-00		
•	3-542-645-00		
	*3-542-646-00	LEVER, FWD	
	*3-542-647-00	SHAFT, SELECTOR CONTROL LEVER	
	7-624-112-04		
172	7-624-109-04	RETAINING, RING E-5	
173	7-624-108-04		
174	7-624-106-04	RING, RETAINING E-3	
175	7-621-759-45	+PSW, 2.6X6	
1/6	7-624-106-04 7-624-106-04 7-621-759-45 7-621-759-85	+PSW, 2.6X12	
1//	3-/01-444-21	WASHER, 6	
	3-701-443-11	WASHER, 5 (t=0.25)	
	3-701-443-21		
1/9	3-542-844-00	KNOB, FAST FORWARD CONTROL	



Remarks



0.	Part No.	<u>Description</u>
04 05 06 07 08 09 10 112 13 14 15 16 17 18 19 22 22 24 25 26 27 28 29	7-682-246-01 *3-542-775-00 *3-542-776-00 X-3542-619-2 X-3542-634-0 3-701-437-11 7-624-102-04 3-701-447-21 3-542-790-00 7-682-550-05 3-542-802-00 7-683-403-04 7-621-555-26 7-682-550-05 3-542-803-00 7-683-404-04 3-542-831-00 7-682-253-05 *X-3329-207-1 7-683-404-04 7-688-003-01 X-3542-639-0 X-3542-640-0 3-542-804-00 3-542-804-00 3-542-804-00 3-542-804-00 3-542-804-00 3-542-804-00 3-542-804-00 3-542-804-00 3-542-804-00 3-542-804-00 3-542-804-00 3-542-804-00 3-542-804-00 3-542-804-00 3-542-804-00	SCREW +K 3X5 BUSHING, SHIFTER PLATE PLATE, SHIFTER FUNCTION BUSHING, SHIFTER GUIDE PLATE ASSY, SHIFT, TAPE ROLLER ASSY, GUIDE WASHER RING, RETAINING E-1.5 WASHER, 10 CAP, GUIDE ROLLER SCREW +B 3X12 SUPPORT, HEAD BASE BOLT, HEXAGON SOCKET 3X6 SCREW +K 2X4 SCREW +B 3X5 PLATE, BASE ORNAMENTAL SCREW +K 3X20 BASE ASSY BOLT, HEXAGON SOCKET 3X8 W 3, SMALL HOUSING, METAL, CAPSTAN ARM ASSY, PINCH ROLLER BELT, CAPSTAN NUT, WHEEL FLYWHEEL FLYWHEEL FLYWHEEL FLYWHEEL FLYWHEER WASHER, 5 (t=0.5) RING, RETAINING E-3
30 31 32	*3-542-778-00 7-621-734-09 3-542-819-00	LEVER, PINCH SET-SCT, HEX 2.6X3 SPRING, TENSION
33 34 35 36 37		CUSHION PLATE, SHIELD, MOTOR BRACKET, MOTOR SCREW +PSW 3X6
	*3-542-887-00 *3-542-887-00 8-835-152-01	PLATE, SHIELD CASE, MOTOR SHIELD MOTOR, DC (DNF-0514A)



Remarks

Remarks

Part No.

Description

7-682-246-01

SCREW +K 3X5

BUSHING, SHIFTER PLATE
PLATE
PLATE FUNCTION
3-542-776-00

SUSHING, SHIFTER GUIDE
X-3542-634-0

X-3542-634-0

ROLLER ASSY, GUIDE
3-701-437-11

WASHER
7-624-102-04

RING, RETAINING E-1.5

3-701-447-21

3-542-790-00

CAP, GUIDE ROLLER

7-682-550-05

SCREW +B 3X12

3-542-802-00

SUPPORT, HEAD BASE
7-683-403-04

BOLT, HEXAGON SOCKET 3X6

SCREW +B 3X5

3-542-831-00

PLATE, BASE ORNAMENTAL
SCREW +B 3X5

3-542-831-00

PLATE, BASE ORNAMENTAL
SCREW +K 3X20

\*X-3329-207-1

BASE ASSY
7-688-003-01

X-3542-639-0

X-3542-639-0

X-3542-804-00

3-542-804-00

3-542-808-00

3-542-808-00

3-542-808-00

3-542-808-00

3-542-808-00

3-542-778-00

\*X-621-734-09

SET-SCT, HEX 2.6X3

SPRING, TENSION
CUSHION
\*3-542-819-00

SPRING, TENSION
CUSHION
\*3-542-888-00

P-911-815-02

CUSHION
\*3-542-887-00

\*3-542-887-00

\*3-542-887-00

\*3-542-887-00

\*3-542-887-00

\*3-542-887-00

\*3-542-887-00

\*3-542-887-00

\*3-542-887-00

\*3-542-887-00

\*3-542-887-00

\*3-542-887-00

\*3-542-887-00

\*3-542-887-00

\*3-542-887-00

\*3-542-887-00

\*3-542-888-00

\*3-542-887-00

\*3-542-887-00

\*3-542-888-00

\*3-542-888-00

\*3-542-887-00

\*3-542-888-00

\*3-542-888-00

\*3-542-887-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

\*3-542-888-00

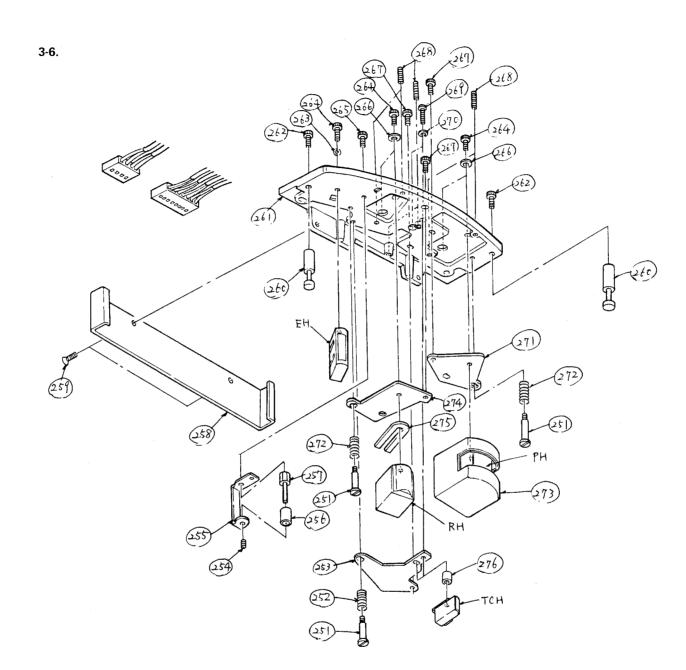
\*3-542-888-00

\*3-542-888-00

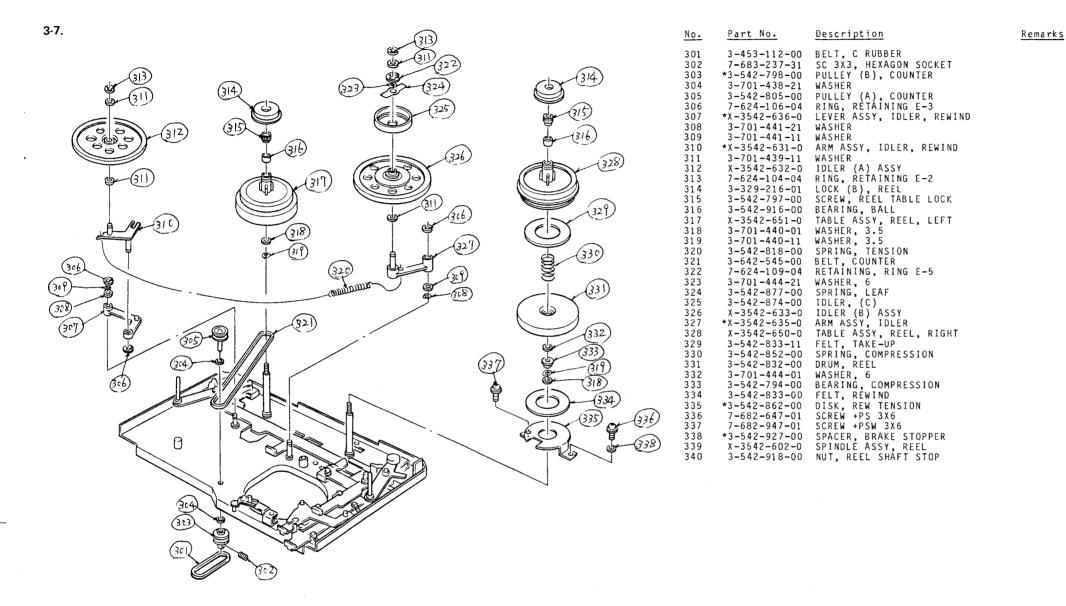
\*3-542-888-00

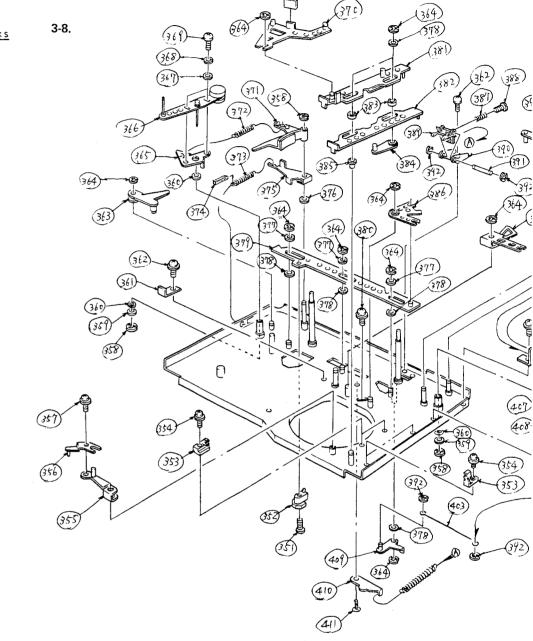
\*3-542-888-00

\*3-542-888-00



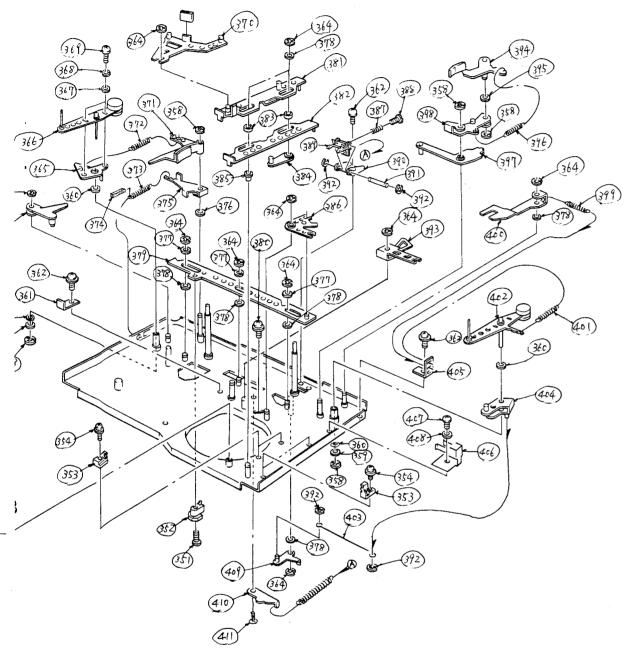
No.	Part No.	Description
251 ? 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 270 271 272 273 274 275 276 EH	0-056-108-00 3-329-218-01 *3-329-202-01 3-146-310-00 X-3472-048-X 3-542-772-00 X-3542-839-00 7-621-559-38 3-142-804-00 *3-329-234-01 7-683-403-04 7-623-205-22 7-621-996-04 7-688-001-12 7-621-996-14 7-621-712-68 7-627-552-97 7-688-008-04 *3-329-203-01	SPRING, COMPRESSION BRACKET, T.C HEAD SCREW ROLLER ASSY HOLDER, ROLLER SHAFT ASSY, ROLLER COVER, HEAD SCREW +K 2.6X5 GUIDE, TAPE BASE, HEAD BOLT, HEXAGON SOCKET 3X6 SW 3, TYPE 2 BOLT, HEXAGON SOCKET 2X5 BOLT, HEXAGON SOCKET 2.6X6 W 2, MIDDLE BOLT, HEXAGON SOCKET 2.6X8 SET-SCT, HEX. 2.6X8 SCREW, PRECISION +P 1.7X6 W 1.7 SMALL BRACKET, PB HEAD SPRING, COMPRESSION CASE, (B) PLAYBACK SHIELD BRACKET, REC HEAD SPACER SPACER, TCH HEAD. ERASE
TCH	8-825-622-10	HEAD, RECORDING RF284-22

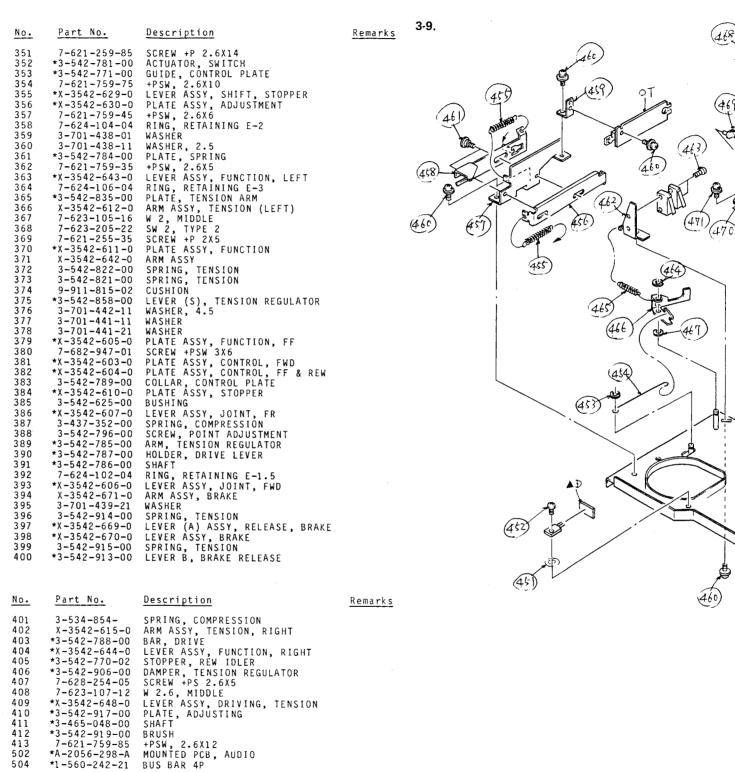




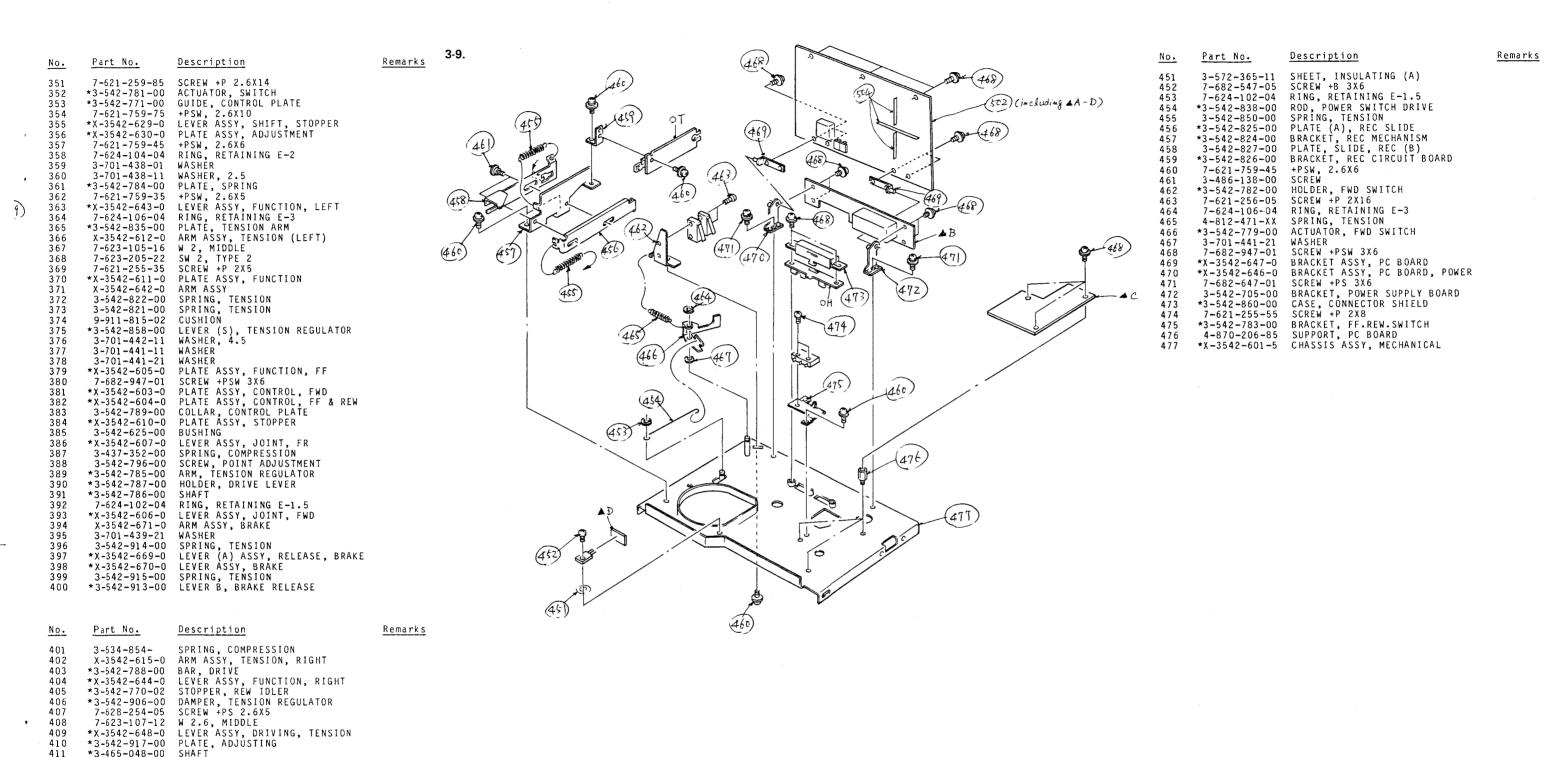
on (473

(460)





502 504



\*3-465-048-00 SHAFT

\*1-560-242-21 BUS BAR 4P

412

\*3-542-919-00 BRUSH 7-621-759-85 +PSW, 2.6X12 \*A-2056-298-A MOUNTED PCB, AUDIO

ELECTRICAL PARTS

## **SECTION 4 ELECTRICAL PARTS LIST**

- Items marked " \* " are not stocked since they are seldom required for routine service. Some delay should be antici-pated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.
- CAPACITORS: MF:μF, PF:μμF.
- RESISTORS · All resistors are in ohms. · F : nonflammable
- COILS · MMH : mH, UH : μH
- SEMICONDUCTORS
- In each case, U : μ, for example:
  UA...: μΑ..., UPA...: μΡΑ..., UPC...: μPC,
  UPD...: μPD...

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.   Part No.   Description   Ref. No.   Part No.   Description	,	ELECTRIC	AL PARTS					ELECTRIC	AL PARTS			
\$63 *A-2056-299-A MOUNTED PCB, AUDIO  \$64 *1-560-242-21 BUS BAR 4P  \$65 *1-560-042-20 PIN, CONNECTOR 4P  \$67 *1-560-042-20 PIN, CONNECTOR 4P  \$68 *1-560-042-20 PIN, CONNECTOR 4P  \$69 *1-560-030-20 PIN, CONNECTOR 4P  \$60 *1-560-030-20 PIN, CONNECTOR 4P  \$610 *1-560-500-11 PIUG, CONNECTOR 4P  \$611 *1-560-500-11 PIUG, CONNECTOR 2P  \$612 *1-560-500-11 PIUG, CONNECTOR 4P  \$613 *1-560-500-11 PIUG, CONNECTOR 4P  \$614 *1-560-500-11 PIUG, CONNECTOR 4P  \$615 *1-560-500-11 PIUG, CONNECTOR 4P  \$615 *1-560-500-11 PIUG, CONNECTOR 4P  \$616 *1-560-500-11 PIUG, CONNECTOR 4P  \$617 *1-560-500-11 PIUG, CONNECTOR 4P  \$618 *1-560-500-11 PIUG, CONNECTOR 4P  \$619 *1-560-500-11 PIUG, CONNECTOR 4P  \$610 *1-600-500-11 PIUG, CONNECTOR 4P  \$610 *1-1000-11 PIUG,	Ref.No.	Part No.	Descriptio	n			Ref.No.	Part No.	Description			
1-566-060-00   PIN, CONNECTOR 4P   C141   1-306-363-00   FILM   CONTECTOR 4P   C141   1-310-303-00   FILM   CONTECTOR 4P   C141   1-310-583-00   FILM   CONTECTOR 4P   C141   1-310-583-00   FILM   CONTECTOR 4P   C142   1-313-522-00   TANTALUM   TOME   20% 25V   C145   1-306-00-00   FILM   CONTECTOR 4P   C144   1-36-169-00   FILM   C0.22MF   53 50V   C145   1-30-299-00   FILM   C0.22MF   53 50V   C147   1-30-273-00   FILM   C0.22MF   53 50V   C149   1-313-522-00   TANTALUM   C0.22MF   54 50V   C150   1-07-310-00   FILM   C0.22MF   54 50V   C150   1-07-310-00   FILM   C0.22MF   C0.22M	502	*A-2056-298-A	MOUNTÉD PC	B, AUDIO			C130 C131	1-107-165-00 1-141-034-	MICA CAP,TRIMMER	56PF 120PF	5%	500V
1-560-60-60-00   PIN. CONNECTOR 4P   C144   1-136-159-00   FILM   C2MF   5x   500   C145   C1-130-299-00   FILM   C2MF   5x   500   C146   C1-130-299-00   FILM   C2MF   C2MF   C147   C1-130-299-00   FILM   C2MF   C2MF   C148   C1-130-299-00   FILM   C2MF   C2MF   C148   C1-130-299-00   FILM   C2MF   C2MF   C148   C1-130-293-00   FILM   C2MF	505	*1-560-060-00	PIN, CONNE	CTOR 2P			C141	1-130-683-00	FILM	0.027MF	2%	630V
\$11	508	*1-560-603-00	PIN, CONNE	CTOR 4P			C143 C144	1-136-169-00	FILM	0.22MF	5%	501
Side	511	*1-564-505-21	PLUG, CONN	ECTOR 2P			C146 C147	1-107-165-00 1-130-273-00	FILM	0.001MF	5%	1000
1-564-507-31	514	*1-564-506-11	PLUG, CONN	ECTOR 3P			C149 C150	1-131-522-00 1-107-310-00	TANTALUM MICA	1 OMF 220PF	20% 5%	500V
1-564-508-11	517	*1-564-507-31	PLUG, CONN	ECTOR 4P			C152 C153	1-123-306-00 1-162-306-31	ELECT CERAMIC	47MF 0.01MF	20%	10V 16V
522 *1-564-519-11 PLUG, CONNECTOR 4P 523 *1-564-521-11 PLUG, CONNECTOR 6P 524 *1-564-521-11 PLUG, CONNECTOR 6P 525 *1-23-370-00 ELECT 10MF 20% 63V 527 50V 528 50V 529 50V 520 50V	520	*1-564-509-11	PLUG, CONN	ECTOR 6P			C162 C163	1-136-163-00 1-123-307-00	FILM ELECT	0.068MF 100MF	5% 20%	50V 10V
C102 1-123-370-00 ELECT 10MF 20% 63V C205 1-123-356-00 ELECT 10MF 20% 50V C206 1-123-356-00 ELECT 10MF 20% 50V C207 1-162-294-31 CERAMIC 0.001MF 10% 50V C209 1-131-522-00 TANTALUM 0.0MF 20% 25V C219 1-131-522-00 TANTALUM 0.0MF 20% 25V C219 1-131-522-00 TANTALUM 0.0MF 20% 25V C219 1-131-522-00 TANTALUM 0.0MF 20% 25V C229 1-131-522-00 TANTALUM 0.0MF 20% 20% 10V C229 1-131-520-00 TANTALUM 0.0MF 20% 20% 10V C229 1-131-520-00 TANTALUM 0.0MF 20% 20% 10V C229 1-131-520-00 TANTALUM 0.0MF 20% 20% 10V C229							C202	1-123-370-00	ELECT	10MF	20%	63V
C105	C102 C103	1-123-370-00 1-123-370-00	ELECT ELECT	10MF 10MF	20% 20%	63V 63V	C205 C206	1-123-356-00 1-123-356-00	ELECT ELECT	10MF 10MF	20% 20%	5 O V 5 O V
C108 1-123-307-00 ELECT 100MF 20% 10V C110 1-162-294-31 CERAMIC 0.001MF 10% 50V C110 1-162-294-31 CERAMIC 0.001MF 10% 50V C110 1-124-185-00 ELECT 4.7MF 20% 50V C211 1-131-522-00 TANTALUM 10MF 20% 25V C213 1-131-522-00 TANTALUM 10MF 20% 25V C214 1-107-310-00 MICA 220PF 5% 500V C212 1-131-522-00 TANTALUM 10MF 20% 25V C222 1-131-522-00 TANTALUM 10MF 20% 25V C224 1-123-380-00 ELECT 1MF 20% 50V C225 1-123-306-00 ELECT 47MF 20% 10V C228 1-131-520-00 TANTALUM 22MF 20% 16V C229 1-107-310-00 MICA 220PF 5% 500V C228 1-131-520-00 TANTALUM 22MF 20% 16V C229 1-107-310-00 MICA 56PF 5% 500V C228 1-131-520-00 TANTALUM 22MF 5% 500V C228 1-107-165-00 MICA 56PF 5% 500V C228 1-107-165-00 MICA 56PF 5% 500V	C106	1-123-356-00	ELECT	10MF	20%	50V	C208 C209	1-123-307-00 1-162-294-31	ELECT CERAMIC	100MF 0.001MF	20%	10V 50V
C112 1-131-522-00 TANTALUM 10MF 20% 25V C214 1-107-310-00 MICA 220PF 5% 500V C221 1-131-522-00 TANTALUM 10MF 20% 25V C222 1-131-522-00 TANTALUM 10MF 20% 25V C223 1-107-310-00 MICA 220PF 5% 500V C122 1-131-522-00 TANTALUM 10MF 20% 25V C224 1-123-380-00 ELECT 1MF 20% 50V C225 1-123-306-00 ELECT 47MF 20% 10V C225 1-123-306-00 ELECT 47MF 20% 10V C225 1-123-306-00 FILM 0.22MF 5% 50V C124 1-123-380-00 ELECT 47MF 20% 10V C227 1-131-520-00 TANTALUM 22MF 20% 16V C228 1-131-520-00 MICA 220PF 5% 500V C128 1-131-520-00 TANTALUM 22MF 20% 16V C230 1-107-165-00 MICA 56PF 5% 500V	C109	1-162-294-31	CERAMIC	0.001MF	10%	50V	C211 C212	1-136-167-00 1-131-522-00	TANTALUM	10MF	20%	25 V
C121 1-131-522-00 TANTALUM 10MF 20% 25V C223 1-107-310-00 MICA 220PF 5% 50V C224 1-123-380-00 ELECT 1MF 20% 50V C225 1-123-306-00 ELECT 47MF 20% 10V C225 1-123-306-00 ELECT 47MF 20% 10V C225 1-123-306-00 FILM 0.22MF 5% 50V C228 1-131-520-00 TANTALUM 22MF 20% 16V C228 1-131-520-00 TANTALUM 22MF 20% 16V C128 1-131-520-00 TANTALUM 22MF 20% 16V C128 1-131-520-00 TANTALUM 22MF 20% 16V C128 1-131-520-00 TANTALUM 22MF 20% 16V C230 1-107-165-00 MICA 220PF 5% 500V C128 1-131-520-00 TANTALUM 22MF 20% 16V C230 1-107-165-00 MICA 56PF 5% 500V C128 1-131-520-00 TANTALUM 22MF 20% 16V C230 1-107-165-00 MICA 56PF 5% 500V C128 1-131-520-00 TANTALUM 22MF 20% 16V C230 1-107-165-00 MICA 56PF 5% 500V	C112	1-131-522-00	TANTALUM	10MF	20%	25 V	C221	1-131-522-00	TANTALUM	1 OMF	20%	25V
C124 1-123-380-00 ELECT 1MF 20% 50V C226 1-136-169-00 FILM 0.22MF 5% 50V C125 1-123-306-00 ELECT 47MF 20% 10V C227 1-131-520-00 TANTALUM 22MF 20% 16V C228 1-131-520-00 TANTALUM 22MF 20% 16V C228 1-131-520-00 TANTALUM 22MF 20% 16V C127 1-131-520-00 TANTALUM 22MF 20% 16V C128 1-131-520-00 TANTALUM 22MF 20% 16V C229 1-107-310-00 MICA 220PF 5% 500V C128 1-131-520-00 TANTALUM 22MF 20% 16V C230 1-107-165-00 MICA 56PF 5% 500V	C121	1-131-522-00	TANTALUM	1 OMF	20%	25V	C224	1-123-380-00	ELECT	1MF	20%	50V
C126 1-136-169-00 FILM 0.22MF 5% 50V C127 1-131-520-00 TANTALUM 22MF 20% 16V C229 1-107-310-00 MICA 220PF 5% 500V C128 1-131-520-00 TANTALUM 22MF 20% 16V C230 1-107-165-00 MICA 56PF 5% 500V	C124	1-123-380-00	ELECT	1 MF	20%	501	C227	1-131-520-00	TANTALUM	22MF	20%	16V
	C127	1-131-520-00	TANTALUM	22MF	20%	16V	C229 C230	1-107-310-00 1-107-165-00	MICA MICA	220PF 56PF	5%	500V

					ļ						
Ref.No.	Part No.	Descripti	<u>on</u>			Ref.No.	Part No.	Descripti	<u>i on</u>		
C232 C233 C241	1-130-297-00 1-130-303-00 1-130-683-00	FILM FILM FILM	0.01MF 0.018MF 0.027MF	5% 5% 2%	100V 100V 630V	C610 C611 C612	1-162-306-31 1-162-306-31 1-162-306-31	CERAMIC CERAMIC CERAMIC	0.01MF 0.01MF 0.01MF	30% 30% 30%	16V
C242 C243 C244	1-131-522-00 1-131-522-00 1-136-169-00	TANTALUM TANTALUM FILM	10MF 10MF 0.22MF	20% 20% 5%	25V 25V 50V	C701 C702 C703	1-123-618-00 1-162-306-31 1-162-306-31	ELECT CERAMIC CERAMIC	22MF 0.01MF 0.01MF	20% 30% 30%	
C245 C246 C247	1-130-299-00 1-107-165-00 1-130-273-00	FILM MICA FILM	0.012MF 56PF 0.001MF	5% 5% 5%	100V 500V 100V	C704 C705 C706	1-162-306-31 1-162-306-31 1-162-306-31	CERAMIC CERAMIC CERAMIC	0.01MF 0.01MF 0.01MF	30% 30% 30%	16V
C248 C249 C250	1-131-522-00 1-131-522-00 1-107-310-00	TANTALUM TANTALUM MICA	10MF 10MF 220PF	20% 20% 5%	25V 25V 500V	C707 C708 C709	1-162-306-31 1-162-306-31 1-162-306-31	CERAMIC CERAMIC CERAMIC	0.01MF 0.01MF 0.01MF	30% 30% 30%	16V
C251 C252 C253	1-123-380-00 1-123-306-00 1-162-306-31	ELECT ELECT CERAMIC	1MF 47MF 0.01MF	20% 20% 30%	50V 10V 16V	C710 C711 C721	1-162-207-31 1-162-207-31 1-	CERAMIC CERAMIC	22PF 22PF 220PF	5% 5%	50V 50V
C261 C262 C263	1-123-356-00 1-136-163-00 1-123-307-00	ELECT FILM ELECT	10MF 0.068MF 100MF	20% 5% 20%	25V 50V 10V	C722 C723 C724	1- 1- 1-		220PF 0.1MF 0.0033MF		
C301 C302 C303	1-131-450-00 1-131-450-00 1-131-450-00	TANTALUM TANTALUM TANTALUM	1MF 1MF 1MF	20% 20% 20%	50V 50V 50V	C725 C726 C727	1- 1- 1-		220PF 220PF 0.01MF		
C304 C304 C311	1-131-450-00 1-131-520-00 1-131-450-00	TANTALUM TANTALUM TANTALUM	1 MF 22 MF 1 MF	20% 20% 20%	50V 16V 50V	C728 C729 C730	1- 1- 1-		0.01MF 0.01MF 0.01MF		
C312 C313 C314	1-131-450-00 1-123-333-00 1-123-333-00	TANTALUM ELECT ELECT	1MF 100MF 100MF	20% 20% 20%	50V 16V 16V	C801 C802 C803	1-110-199-00 1-136-157-00 1-136-173-00	MYLAR FILM FILM	0.0022MF 0.022MF 0.47MF	5% 5% 5%	50V 50V 50V
C315 C316 C317	1-131-450-00 1-131-450-00 1-162-306-31	TANTALUM TANTALUM CERAMIC	1 MF 1 MF 0.01 MF	20% 20% 30%	50V 50V 16V	C804 C805 C806	1-136-173-00 1-123-356-00 1-123-356-00	FILM ELECT ELECT	0.47MF 10MF 10MF	5% 20% 20%	50V 25V 25V
C318 C319 C320	1-123-356-00 1-124-282-00 1-124-282-00	ELECT ELECT	10MF 22MF 22MF	20% 20% 20%	50V 25V 25V	C807 C808 C809	1-136-159-00 1-136-155-00 1-131-355-71	FILM FILM TANTALUM	0.033MF 0.015MF 2.2MF	5% 5% 20%	50V 50V 25V
C321 C322 C323	1-123-336-00 1-123-336-00 1-131-450-00	ELECT ELECT TANTALUM	470MF 470MF 1MF	20% 20% 20%	25V 25V 50V	C810 C811 C812	1-123-333-00 1-123-322-00 1-136-167-00	ELECT ELECT FILM	100MF 330MF 0.15MF	20% 20% 5%	
C324 C325 C326	1-131-450-00 1-123-333-00 1-123-333-00	TANTALUM ELECT ELECT	1MF 100MF 100MF	20% 20% 20%	16V 16V	C813 C814 C815	1-136-164-00 1-136-153-00 1-130-188-00	FILM FILM FILM	0.082MF 0.01MF 0.01MF	5% 5% 5%	50V 50V 100V
C327 C331 C332	1-162-306-31 1-123-333-00 1-123-333-00	CERAMIC ELECT ELECT	0.01MF 100MF 100MF	30% 20% 20%	16V 16V 16V	C816 C817 C818	1-136-158-00 1-110-204-00 1-162-207-31	FILM MYLAR CERAMIC	0.027MF 0.0056MF 22PF	5% 5% 5%	50V 50V 50V
C333 C334 C335	1-123-381-00 1-123-369-00 1-123-307-00	ELECT ELECT	2.2MF 4.7MF 100MF	20% 20% 20%	50V 50V 10V	C819 C820 C901	1-162-219-31 1-162-219-31 1-123-706-	CERAMIC CERAMIC ELECT	68PF 68PF 470MF	5% 5% 20%	50V 50V 35V
C336 C337 C338	1-162-286-31 1-136-169-00 1-123-321-00	CERAMIC FILM ELECT	220PF 0.22MF 220MF	10% 5% 20%	50V 50V 16V	C 902 C 903 C 905	1-123-706- 1-131-520-00 1-123-345-00	ELECT TANTALUM ELECT	470MF	20% 20% 20%	35V 16V
C339 C340	1-123-308-00 1-123-306-00	ELECT	220MF 47MF	20%	10V 10V	C 9 0 6 C 9 0 9	1-123-345-00 1-107-206-00	ELECT MICA	100MF 15PF	20% 5%	35V 500V
C601 C602	1-123-308-00 1-123-308-00	ELECT	220MF 220MF	20% 20%	10V 10V	C910 C911	1-107-206-00	MICA	15PF 100MF	5% 20%	500V 63V
C603 C604 C605	1-124-182-00 1-124-182-00 1-162-306-31	ELECT ELECT CERAMIC	1MF 1MF 0.01MF	20% 20% 30%	50V 50V 16V	C912 C913	1-162-294-31 1-123-356-00	CERAMIC ELECT	0.001MF 10MF	10%	50V 50V
C606 C607 C608	1-123-379-00 1-124-183-00 1-123-307-00	ELECT ELECT ELECT	0.47MF 2.2MF 100MF	20% 20% 20%	50V 50V 10V	C914 C915 C916	1-123-359-00 1-162-306-31 1-123-334-00	ELECT CERAMIC ELECT	47MF 0.01MF 220MF	20% 30% 20%	16V

ELECTRICAL PARTS

ELECTRICAL PARTS	ELECTRICAL PARTS	ELECTRICAL PARTS	ELECTRICAL PARTS
Ref.No. Part No. Description	Ref.No. Part No. Description	Ref.No. Part No. Description	Ref.No. Part No. Description
C917 1-162-306-31 CERAMIC 0.01MF 30% 16V	EH 1-543-272-11 HEAD, ERASE  IC301 8-759-910-75 IC LF353DP	Q201 8-729-334-58 TRANSISTOR 2SC1345	R115 1-214-753-00 METAL 10K 1% 1/4W
C918 1-123-334-00 ELECT 220MF 20% 25V		Q202 8-729-334-58 TRANSISTOR 2SC1345	R116 1-214-755-00 METAL 12K 1% 1/4W
C919 1-123-323-00 ELECT 470MF 20% 16V		Q203 8-729-334-58 TRANSISTOR 2SC1345	R117 1-214-755-00 METAL 12K 1% 1/4W
C920 1-123-374-00 ELECT 100MF 20% 63V	IC302 8-759-745-60 IC NJM4560D	Q204 8-729-334-58 TRANSISTOR 2SC1345	R118 1-214-741-00 METAL 3.3K 1% 1/4W
C921 1-123-336-00 ELECT 470MF 20% 25V	IC303 8-759-910-75 IC LF353DP	Q205 8-729-201-04 TRANSISTOR 2SC2878	R119 1-214-777-00 METAL 100K 1% 1/4W
C922 1-123-336-00 ELECT 470MF 20% 25V	IC304 8-759-145-58 IC UPC4558C	Q206 8-729-201-04 TRANSISTOR 2SC2878	R120 1-214-715- METAL 270 1% 1/4W
C923 1-123-324-00 ELECT 1000MF 20% 16V	IC305 8-759-602-33 IC CX20197	Q207 8-729-201-04 TRANSISTOR 2SC2878	R121 1-214-753-00 METAL 10K 1% 1/4W
C924 1-123-324-00 ELECT 1000MF 20% 16V	IC306 8-759-700-04 IC NJM2043D-D	Q208 8-729-201-04 TRANSISTOR 2SC2878	R122 1-214-777-00 METAL 100K 1% 1/4W
C925 1-123-321-00 ELECT 220MF 20% 16V	IC307 8-759-602-33 IC CX20197	Q209 8-729-201-04 TRANSISTOR 2SC2878	R123 1-214-777-00 METAL 100K 1% 1/4W
C926 1-123-330-00 ELECT 22MF 20% 16V	IC308 8-759-145-58 IC UPC4558C	Q301 8-729-606-33 TRANSISTOR 2SC2603-F	R124 1-214-769-00 METAL 47K 1% 1/4W
C927 1-123-307-00 ELECT 100MF 20% 10V	IC309 8-759-600-02 IC M5218L	Q302 8-729-606-33 TRANSISTOR 2SC2603-F	R125 1-214-769-00 METAL 47K 1% 1/4W
C928 1-161-937-00 CERAMIC 0.01MF 250V	IC310 8-759-157-52 IC UPC575C2	Q303 8-729-606-33 TRANSISTOR 2SC2603-F	R126 1-214-741-00 METAL 3.3K 1% 1/4W
C929 1-123-356-00 ELECT 10MF 20% 25V	IC601 8-759-900-72 IC NE5532P	Q304 8-729-606-33 TRANSISTOR 2SC2603-F	R128 1-214-741-00 METAL 3.3K 1% 1/4W
C930 1-123-332-00 ELECT 47MF 20% 25V	IC602 8-759-909-33 IC LM311P	Q305 8-729-900-65 TRANSISTOR DTA144ES	R129 1-214-777-00 METAL 100K 1% 1/4W
C931 1-162-294-31 CERAMIC 0.001MF 10% 50V	IC701 8-759-240-40 IC TC4040BP	Q306 8-729-900-65 TRANSISTOR DTA144ES	R131 1-214-737-00 METAL 2.2K 1% 1/4W
CN102 1-509-176-31 CONNECTOR (RECEPTACLE) 3P	IC703 8-759-205-86 IC TC5504AP-3	Q601 8-729-606-33 TRANSISTOR 2SC2603-F	R132 1-214-745-00 METAL 4.7K 1% 1/4W
CN101 1-509-184-31 CONNECTOR (RECEPTACLE) 3P	IC704 8-759-140-11 IC UPD4011BC	Q602 8-729-606-33 TRANSISTOR 2SC2603-F	R133 1-214-777-00 METAL 100K 1% 1/4W
CN201 1-509-184-31 CONNECTOR (RECEPTACLE) 3P	IC705 8-759-240-13 IC TC4013BP	Q603 8-729-606-33 TRANSISTOR 2SC2603-F	R134 1-214-705-00 METAL 100 1% 1/4W
CN202 1-509-176-31 CONNECTOR (RECEPTACLE) 3P	IC704 8-759-240-11 IC UPD4011BC  IC705 8-759-240-13 IC TC4013BP IC706 8-759-240-69 IC TC4069UBP IC707 8-759-240-13 IC TC4013BP IC708 8-759-240-13 IC TC4013BP	Q604 8-729-900-89 TRANSISTOR DTC144ES	R136 1-214-719-00 METAL 390 1% 1/4W
CN301 1-562-973-11 SOCKET, CONNECTOR 7P		Q801 8-729-606-33 TRANSISTOR 2SC2603-F	R137 1-214-761-00 METAL 22K 1% 1/4W
CN601 1-509-184-31 CONNECTOR (RECEPTACLE) 3P		Q802 8-729-180-92 TRANSISTOR 2SD809-K	R138 1-214-777-00 METAL 100K 1% 1/4W
CN901 1-509-177-31 CONNECTOR (RECEPTACLE) 4P  CP1 1-464-555-11 CONVERTER UNIT, DC-DC  CP2 1-464-552-11 OSCILLATION UNIT, BIAS	10712 8-759- 10 10713 8-759- 10	Q803 8-729-180-92 TRANSISTOR 2SD809-K Q804 8-729-900-65 TRANSISTOR DTA144ES Q805 8-729-900-65 TRANSISTOR DTA144ES	R139 1-214-705-00 METAL 100 1% 1/4W R140 1-214-767-00 METAL 39K 1% 1/4W R141 1-214-769-00 METAL 47K 1% 1/4W
D101 8-719-107-94 DIODE 1SS202-1	IC714 8-759- IC	Q806 8-729-900-65 TRANSISTOR DTA144ES	R142 1-247-815-00 CARBON 220 5% 1/6W
D102 8-719-107-94 DIODE 1SS202-1	IC715 8-759- IC	Q807 8-729-900-65 TRANSISTOR DTA144ES	R143 1-247-879-00 CARBON 100K 5% 1/6W
D103 8-719-910-65 DIODE HZ6B2L	IC716 8-759- IC	Q808 8-729-900-89 TRANSISTOR DTC144ES	R144 1-214-767-00 METAL 39K 1% 1/4W
D104 8-719-910-65 DIODE HZ6B2L D105 8-719-910-65 DIODE HZ6B2L D106 8-719-910-65 DIODE HZ6B2L	IC717 8-759- IC IC801 8-751-930-00 IC CX-193 IC802 8-759-700-42 IC NJM2904D IC803 8-759-700-42 IC NJM2904D	Q901 8-729-141-43 TRANSISTOR 2SD414 Q902 8-729-167-62 TRANSISTOR 2SC2676 Q903 8-729-167-62 TRANSISTOR 2SC2676	R145 1-214-737-00 METAL 2.2K 1% 1/4W R146 1-214-753-00 METAL 10K 1% 1/4W R147 1-214-757-00 METAL 15K 1% 1/4W
D201 8-719-107-94 DIODE 1SS202-1	IC803 8-759-700-42 IC NJM2904D	Q904 8-729-203-02 TRANSISTOR 25K30A-0	R148 1-214-753-00 METAL 10K 1% 1/4W
D202 8-719-107-94 DIODE 1SS202-1	IC804 8-759-178-05 IC UPC78L05	Q905 8-729-113-82 TRANSISTOR 25A1138	R149 1-214-737-00 METAL 2.2K 1% 1/4W
D203 8-719-910-65 DIODE HZ6B2L	J301 1-507-770-00 JACK (LARGE TYPE)	Q906 8-729-113-82 TRANSISTOR 25A1138	R150 1-214-761-00 METAL 22K 1% 1/4W
D204 8-719-910-65 DIODE HZ6B2L	L901 1-408-080-00 MICRO INDUCTOR 100UH  LV101 1-407-288-00 MICRO INDUCTOR 4.7MMH LV102 1-407-289-00 MICRO INDUCTOR 6.8MMH	Q907 8-729-154-83 TRANSISTOR 2SB548	R151 1-214-872-00 METAL 2.2K 1% 1/2W
D205 8-719-910-65 DIODE HZ6B2L		Q908 8-729-203-02 TRANSISTOR 2SK30A-0	R152 1-214-709-00 METAL 150 1% 1/4W
D206 8-719-910-65 DIODE HZ6B2L		Q909 8-729-307-58 TRANSISTOR 2SC1775-A	R153 1-214-785-00 METAL 220K 1% 1/4W
D301 8-719-107-94 DIODE 1SS202-1	LV103 1-407-240-00 MICRO INDUCTOR 22MMH  LV104 1-407-240-00 MICRO INDUCTOR 22MMH  LV201 1-407-288-00 MICRO INDUCTOR 4.7MMH	Q910 8-729-201-04 TRANSISTOR 2SC2878-B	R154 1-247-859-00 CARBON 15K 5% 1/6W
D302 8-719-107-94 DIODE 1SS202-1		Q911 8-729-201-04 TRANSISTOR 2SC2878-B	R155 1-214-709-00 METAL 150 1% 1/4W
D303 8-719-107-94 DIODE 1SS202-1		Q912 8-729-900-67 TRANSISTOR DTA124XS	R156 1-214-761-00 METAL 22K 1% 1/4W
D304 8-719-900-24 DIODE SLP24B	LV202 1-407-289-00 MICRO INDUCTOR 6.8MMH  LV203 1-407-240-00 MICRO INDUCTOR 22MMH	Q913 8-729-606-33 TRANSISTOR 2SC2603-F	R157 1-214-785-00 METAL 220K 1% 1/4W
D305 8-719-910-94 DIODE HZ9BIL		Q914 8-729-606-33 TRANSISTOR 2SC2603-F	R158 1-247-859-00 CARBON 15K 5% 1/6W
D306 8-719-900-24 DIODE SLP24B		Q915 8-729-606-33 TRANSISTOR 2SC2603-F	R161 1-214-765-00 METAL 33K 1% 1/4W
D601 8-719-910-63 DIODE HZ6A3L	LV204 1-407-240-00 MICRO INDUCTOR 22MMH  M801 8-835-152-01 MOTOR, DC (DNF-0514A)  ME101 1-520-484-11 METER, LEVEL	Q916 8-729-606-33 TRANSISTOR 2SC2603-F	R162 1-214-844-00 METAL 150 1% 1/2W
D602 8-719-910-94 DIODE HZ9B1L		Q917 8-729-606-33 TRANSISTOR 2SC2603-F	R163 1-214-876-00 METAL 3.3K 1% 1/2W
D603 8-719-107-94 DIODE 1SS202-1		Q918 8-729-201-04 TRANSISTOR 2SC2878	R164 1-214-779-00 METAL 120K 1% 1/4W
D801 8-719-107-94 DIODE 1SS202-1	ME201 1-520-484-21 METER, LEVEL PH 8-825-557-60 HEAD, PB	R101 1-215-441-00 METAL 6.8K 1% 1/6W	R165 1-214-739-00 METAL 2.7K 1% 1/4W
D802 8-719-107-94 DIODE 1SS202-1		R102 1-215-441-00 METAL 6.8K 1% 1/6W	R166 1-214-739-00 METAL 2.7K 1% 1/4W
D803 8-719-910-77 DIODE HZ7C1L		R103 1-215-403-81 METAL 180 1% 1/6W	R167 1-214-739-00 METAL 2.7K 1% 1/4W
D901 8-719-910-65 DIODE HZ6B2L	PL1 1-518-299-91 LAMP, PILOT	R104 1-215-403-81 METAL 180 1% 1/6W	R168 1-214-788-00 METAL 300K 1% 1/4W
D902 8-719-910-65 DIODE HZ6B2L	PL2 1-518-299-91 LAMP, PILOT	R107 1-214-761-00 METAL 22K 1% 1/4W	R169 1-247-859-00 CARBON 15K 5% 1/6W
D903 8-719-200-02 DIODE 10E-2	Q101 8-729-334-58 TRANSISTOR 2SC1345	R108 1-214-689- METAL 22 1% 1/4W	R170 1-214-729-00 METAL 1K 1% 1/4W
D904 8-719-910-42 DIODE HZ24-2L	Q102 8-729-334-58 TRANSISTOR 2SC1345	R109 1-214-689- METAL 22 1% 1/4W	R171 1-214-777-00 METAL 100K 1% 1/4W
D905 8-719-910-42 DIODE HZ24-2L	Q103 8-729-334-58 TRANSISTOR 2SC1345	R110 1-214-753-00 METAL 10K 1% 1/4W	R172 1-214-723-00 METAL 560 1% 1/4W
D906 8-719-910-63 DIODE HZ6A3L	Q104 8-729-334-58 TRANSISTOR 2SC1345	R111 1-214-753-00 METAL 10K 1% 1/4W	R173 1-214-761-00 METAL 22K 1% 1/4W
D907 8-719-107-94 DIODE 1SS202-1 D908 8-719-910-65 DIODE HZ6B2L D909 8-719-107-94 DIODE 1SS202-1	Q105 8-729-201-04 TRANSISTOR 2SC2878 Q106 8-729-201-04 TRANSISTOR 2SC2878	R112 1-214-777-00 METAL 100K 1% 1/4W R113 1-214-737-00 METAL 2.2K 1% 1/4W R114 1-214-737-00 METAL 2.2K 1% 1/4W	R174 1-214-777-00 METAL 100K 1% 1/4W R175 1-214-785-00 METAL 220K 1% 1/4W R176 METAL 300 1% 1/4W
	Q107 8-729-201-04 TRANSISTOR 2SC2878 Q108 8-729-201-04 TRANSISTOR 2SC2878 Q109 8-729-201-04 TRANSISTOR 2SC2878		

	ELECTRIC	AL PARTS				ELECTRIC	AL PARTS					ELECTRIC	AL PARTS					ELECTRIC	CAL PARTS			
if.No.	Part No.	Description			Ref.No.	Part No.	Description				Ref.No.	Part No.	Description				Ref.No.	Part No.	Description	<u>n</u>		
R177 R178 R179	1-247-847-00 1-247-847-00		300 1% 4.7K 5% 4.7K 5%	1/4W 1/6W 1/6W	R244 R245 R246	1-214-767-00 1-214-737-00 1-214-753-00	METAL	39K 2.2K 10K		1/4W 1/4W 1/4W	R318 R319 R320	1-247-831-00 1-247-879-00 1-247-879-00	CARBON	1K 100K 100K	5%	1/6W 1/6W 1/6W	R808 R809 R810	1-247-864-00 1-247-843-00 1-249-419-11	CARBON	24K 3.3K 1.5K	5%	1/6W 1/6W 1/6W
R180 R181 R182	1-214-761-00 1-214-785-00 1-249-429-11	METAL	22K 1% 220K 1% 10K 5%	1/4W 1/4W 1/6W	R247 R248 R249	1-214-757-00 1-214-753-00 1-214-737-00	METAL	15K 10K 2.2K	1 %	1/4W 1/4W 1/4W	R321 R322 R323	1-247-857-00 1-247-857-00 1-249-421-11	CARBON	12K 12K 2.2K	5%	1/6W 1/6W 1/6W	R811 R812 R813		METAL METAL METAL	47K 47K 3.3K	1 %	1/6W 1/6W 1/6W
R183 R184 R <sub>4</sub> 185	1-247-857-00 1-247-889-00 1-249-429-11	CARBON	12K 5% 270K 5% 10K 5%	1/6W 1/6W 1/6W	R250 R251 R252	1-214-761-00 1-214-872-00 1-214-709-00	METAL	22K 2.2K 150	1 %	1/4W 1/2W 1/4W	R331 R332 R333	1-214-705-00 1-214-705-00 1-247-879-00	METAL	100 100 100K	1%	1/4W 1/4W 1/6W	R814 R815 R817	1-247-879-00 1-247-849-00		3.3K 100K 5.6K	5%	1/6W 1/6W 1/6W
R186 R187 R191	1-247-815-00 1-247-831-00 1-214-729-00	CARBON	220 5% 1K 5% 1K 1%	1/6W 1/6W 1/4W	R253 R254 R255	1-214-785-00 1-247-859-00 1-214-709-00	CARBON	220K 15K 150		1/4W 1/6W 1/4W	R334 R335 R341	1-247-807-00 1-247-807-00 1-247-831-00	CARBON	100 100 1K	5% 5% 5%	1/6W 1/6W 1/6W	R818 R819 R820	1-247-863-00 1-244-801- 1-206-455-00	CARBON	22K 1 4.7	5% 5% 5%	1/6W 1/2W 2W
R192 R193 R194	1-214-785-00 1-214-785-00 1-214-777-00	METAL	220K 1% 220K 1% 100K 1%	1/4W 1/4W 1/4W	R256 R257 R258	1-214-761-00 1-214-785-00 1-247-859-00	METAL	22K 220K 15K	1 % 1 % 5 %	1/4W 1/4W 1/6W	R342 R343 R344	1-247-871-00 1-247-883-00 1-247-881-00	CARBON	47K 150K 120K	5%	1/6W 1/6W 1/6W	R821 R822 R823	1-247-879-00 1-247-807-00 1-247-859-00	CARBON	100	5% 5% 5%	1/6W 1/6W 1/6W
R195 R196 R197	1-214-769-00 1-247-863-00 1-249-429-11	CARBON	47K 1% 22K 5% 10K 5%	1/4W 1/6W 1/6W	R261 R262 R263	1-214-765-00 1-214-844-00 1-214-876-00	METAL	33K 150 3.3K	1 % 1 % 1 %	1/4W 1/2W 1/2W	R345 R347 R348	1-247-809-00 1-249-455-11 1-247-688-11	CARBON	120 4.7 10	5% 5% 5%	1/6W 1/4W 1/4W	R824 R825 R826	1-247-859-00 1-247-869-00 1-247-869-00	CARBON	15K 39K 39K	5% 5% 5%	1/6W 1/6W 1/6W
R198 R201 R202	1-214-707-00 1-215-441-00 1-215-441-00	METAL	120 1% 6.8K 1% 6.8K 1%		R264 R265 R266	1-214-779-00 1-214-739-00 1-214-739-00	METAL	120K 2.7K 2.7K	1 %	1/4W 1/4W 1/4W	R351 R601 R602	1-249-421-11 1-247-851-00 1-247-843-00	CARBON	2.2K 6.8K 3.3K	5%	1/6W 1/6W 1/6W	R827 R828 R829	1-249-429-11 1-215-481-00 1-215-445-00	METAL		5% 1% 1%	1/6W 1/6W 1/6W
R203 R204 R207	1-215-403-81 1-215-403-81 1-214-761-00	METAL	180 1% 180 1% 22K 1%	1/6W 1/6W 1/4W	R267 R268 R269	1-214-739-00 1-214-788-00 1-247-859-00	METAL	2.7K 300K 15K	1 %	1/4W 1/4W 1/6W	R603 R604 R605	1-247-857-00 1-247-857-00 1-247-871-00	CARBON	12K 12K 47K	5% 5% 5%	1/6W 1/6W 1/6W	R830 R831 R832	1-215-445-00 1-215-475-00 1-215-466-81	METAL		1 % 1 % 1 %	1/6W 1/6W 1/6W
R208 R209 R210	1-214-689- 1-214-689- 1-214-753-00	METAL METAL METAL	22 1% 22 1% 10K 1%	1/4W 1/4W 1/4W	R270 R271 R272	1-214-729-00 1-214-777-00 1-214-723-00	METAL	1K 100K 560	1 % 1 % 1 %	1/4W 1/4W 1/4W	R606 R607 R608	1-247-871-00 1-247-868-00 1-247-868-00	CARBON	47K 36K 36K	5% 5% 5%	1/6W 1/6W 1/6W	R833 R834 R835	1-249-429-11 1-249-429-11 1-249-429-11	CARBON	1 0 K 1 0 K 1 0 K	5% 5% 5%	1/6W 1/6W 1/6W
R211 R212 R213	1-214-753-00 1-214-777-00 1-214-737-00	METAL	10K 1% 100K 1% 2.2K 1%	1/4W 1/4W 1/4W	R273 R274 R275	1-214-761-00 1-214-777-00 1-214-785-00	METAL	22K 100K 220K		1 / 4 W 1 / 4 W 1 / 4 W	R609 R610 R611	1-247-861-00 1-247-831-00 1-249-429-11	CARBON	18K 1K 10K	5% 5% 5%	1/6W 1/6W 1/6W	R901 R902 R903	1-214-870-00 1-214-876-00 1-214-761-00	METAL	1.8K 3.3K 22K		1/2W 1/2W 1/4W
R214 R215 R216	1-214-737-00 1-214-753-00 1-214-755-00	METAL	2.2K 1% 10K 1% 12K 1%		R276 R277 R278	  1-247-847-00	METAL METAL CARBON	300 300 4.7K	1 % 1 % 5 %	1 / 4W 1 / 4W 1 / 6W	R612 R613 R614	1-247-871-00 1-247-841-00 1-247-841-00	CARBON	47K 2.7K 2.7K	5%	1/6W 1/6W 1/6W	R904 R905 R906	1-214-745-00 1-214-870-00 1-214-876-00	METAL	4.7K 1.8K 3.3K	1 %	1/4W 1/2W 1/2W
R217 R218 - R219	1-214-755-00 1-214-741-00 1-214-777-00	METAL	12K 1% 3.3K 1% 100K 1%	1/4W 1/4W 1/4W	R279 R280 R281	1-247-847-00 1-214-761-00 1-214-785-00	METAL	4.7K 22K 220K	1 %	1/6W 1/4W 1/4W	R615 R616 R617	1-247-857-00 1-247-823-00 1-247-807-00	CARBON	12K 470 100		1/6W 1/6W 1/6W	R 9 0 7 R 9 0 7 R 9 0 8 R 9 0 8	1-214-737-00 1-214-761-00 1-214-737-00 1-214-745-00	METAL METAL	2.2K 22K 2.2K 4.7K	1 % 1 %	1/4W 1/4W 1/4W 1/4W
R220 R221 R222	1-214-715- 1-214-753-00 1-214-777-00		270 1% 10K 1% 100K 1%		R282 R283 R284	1-249-429-11 1-247-857-00 1-247-889-00	CARBON	10K 12K 270K	5% 5% 5%	1/6W 1/6W 1/6W	R618 R619 R622	1-247-863-00 1-247-863-00 1-247-823-00	CARBON	22K 22K 470	5 % 5 % 5 %	1/6W 1/6W 1/6W	R911 R912	1-249-421-11 1-249-429-11	CARBON CARBON	100K 2.2K 10K	5% 5%	1/6W 1/6W 1/6W
R223 R224 R225	1-214-777-00 1-214-769-00 1-214-769-00	METAL	100K 1% 47K 1% 47K 1%	1/4W	R285 R286 R287	1-249-429-11 1-247-815-00 1-247-831-00	CARBON	10K 220 1K	5% 5% 5%	1/6W 1/6W 1/6W	R623 R701 R702	1-249-429-11 1-247-903-00 1-247-827-00	CARBON CARBON CARBON	10K 1M 680	5% 5% 5%	1/6W 1/6W 1/6W	R 915	1-249-429-11 1-249-421-11 1-247-871-00 1-249-429-11	CARBON CARBON	2.2K 47K	5% 5%	1/6W 1/6W
R226 R228 R229	1-214-741-00 1-214-741-00 1-214-777-00	METAL	3.3K 1% 3.3K 1% 100K 1%	1/4W	R291 R292 R293	1-214-729-00 1-214-785-00 1-214-785-00	METAL	1 K 220 K 220 K		1/4W 1/4W 1/4W	R721 R722 R723	1 - 1 - 1 -	CARBON CARBON CARBON	10K 10K 56K			R916 R917 R918	1-247-879-00	CARBON CARBON	10K 100K 47K	5%	1/6W 1/6W 1/6W
R231 R232 R233	1-214-737-00 1-214-745-00 1-214-777-00	METAL	2.2K 1% 4.7K 1% 100K 1%	1/4W	R294 R295 R296	1-214-777-00 1-214-769-00 1-247-863-00	METAL	100K 47K 22K		1/4W 1/4W 1/6W	R724 R725 R726	1 - 1 - 1 -	CARBON CARBON CARBON	10K 56K 680K			R919 R920 R921	1-247-871-00 1-247-787-00 1-247-871-00	CARBON	47K 15 47K	5% 5% 5%	1/6W 1/6W 1/6W
R234 R236 R237	1 -214-705-00 1 -214-719-00 1 -214-761-00	METAL METAL	100 1% 390 1% 22K 1%	1/4W 1/4W	R297 R298 R311	1-249-429-11 1-214-707-00 1-247-807-00	CARBON METAL	10K 120 100	5% 1% 5%	1/6W 1/4W 1/6W	R727 R728 R801	1- 1- 1-247-831-00	CARBON CARBON CARBON	10K 10K 1K	5%	1/6W	R922 R923 R924	1-247-879-00 1-247-879-00 1-247-831-00	CARBON		5% 5% 5%	1/6W 1/6W 1/6W
Ŕ238 R239	1-214-777-00 1-214-705-00	METAL METAL	100K 1% 100 1%	1/4W 1/4W	R312 R313	1-247-807-00 1-214-729-00 1-214-755-00	CARBON METAL	100 1K 12K	5 % 1 % 1 %	1/6W 1/4W 1/4W	R802 R803 R804	1-247-831-00 1-249-429-11 1-247-879-00	CARBON CARBON	1K 10K 100K	5 % 5 %	1/6W 1/6W 1/6W	R 925 R 926 R H	1-247-879-00 1-247-831-00 8-825-558-20	CARBON CARBON		5% 5%	1/6W 1/6W
R240 R241 R242 R243	1-214-767-00 1-214-769-00 1-247-815-00 1-247-879-00	METAL CARBON	39K 1% 47K 1% 220 5% 100K 5%	1/4W 1/6W	R314 R315 R316 R317	1-247-783-00 1-247-879-00 1-247-831-00	CARBON CARBON	10 100K 1K	5% 5%	1/6W 1/6W 1/6W	R805 R806 R807	1-247-831-00 1-247-850-00 1-247-864-00	CARBON CARBON	1K 6.2K	5%	1/6W 1/6W 1/6W	RV101 RV102 RV103		RES, VAR, RES, ADJ, RES, ADJ,	METAL GLA METAL GLA	ZE 10k ZE 10k	<b>(</b>

### ELECTRICAL PARTS

Ref.No.	Part No.	Description
RV105	1-226-439-00	RES, VAR, CARBON 20K
RV201	1-230-949-11	RES, VAR, CARBON 20K/20K
RV202	1-224-252-XX	RES, ADJ, METAL GLAZE 10K
RV203	1-224-252-XX	RES, ADJ, METAL GLAZE 10K
RV204	1-224-250-XX	RES, ADJ, METAL GLAZE 2.2K
RV205	1-226-439-00	RES, VAR, CARBON 20K
RV301 RV801 RV802		RES, ADJ, METAL FILM 22K RES, ADJ, METAL GLAZE 50K RES, ADJ, METAL GLAZE 50K
R Y 3 0 2 R Y 9 0 1	1-515-586-11 1-515-586-11 1-515-587-11 1-515-587-11	RELAY RELAY RELAY RELAY
\$1	1-516-310-00	LEVER SLIDE SWITCH
\$2	1-516-310-00	LEVER SLIDE SWITCH
\$3	1-516-310-00	LEVER SLIDE SWITCH
S 4	1-516-310-00	LEVER SLIDE SWITCH
S 5	1-554-600-11	SWITCH, ROTARY
S 6	1-554-600-11	SWITCH, ROTARY
\$7	1-554-600-11	SWITCH, ROTARY
\$8	1-516-720-00	SWITCH, PUSH (2 KEY)
\$9	1-516-720-00	SWITCH, PUSH (2 KEY)
S10	1-570-390-	SWITCH, SLIDE
S11	1-516-777-XX	SLIDE SWITCH
S12	1-516-503-00	SLIDE SWITCH
S13	1-516-777-XX	SLIDE SWITCH
S14	1-553-004-00	SWITCH, SLIDE
S15	1-553-570-00	SWITCH, MICRO
S16	1-553-571-00	SWITCH, MICRO
SP1	1-502-541-00	SPEAKER, CONE
TCH	8-825-622-10	HEAD, RECORDING RF284-22
X701	1-567-510-11	VIBRATOR, CRYSTAL
X801	1-567-509-11	VIBRATOR, CRYSTAL

## ACCESSORY & PACKING MATERIAL

Part No.	Description
1-506-528-11 3-329-235-01 3-533-950-00 3-542-892-00	PLUG, CONNECTOR 7P INDIVIDUAL CARTON STRAP, SHOULDER BAG, PROTECTION
3-542-894-01 3-542-895-01 3-542-923-00 3-542-924-	CUSHION, (RIGHT) CUSHION, (LEFT) CUSHION, LOWER CUSHION, SIDE
3-701-630-00 3-760-761-11 3-542-925-00 9-910-999-31	BAG, POLYETHYLENE MANUAL, INSTRUCTION HOLDER